THE

AMERICAN GAS-LIGHT JOURNAL.

THE OFFICIAL GAZETTE OF

LIGHT, HEAT, WATER-SUPPLY, AND SEWERAGE.

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The Kerosene patents, from which the coal oil business in the United States originated, were granted to Dr. Gesner, Chemist and Geologist.

MISCELLANEOUS.

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See engravings on page 148, vol. II.

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For engravings, see AMERICAN GAS-LIGHT JOURNAL for June, 1860, page 245. Address the Patentee. JOHN P. KENNEDY, Trenton, N. J.

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Or H. K. SYMMES, Newton, Mass.
See Engravings in AMERICAN GAS-LIGHT JOURNAL for July 1, 1860, page 280.

ANTI-FREEZING APPARATUS.

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See also certificates from Cincinnati, O., and Louisville, Ky. Gas-Works in same number, page 208. Address, JOHN WALTON,
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Samples of the above castings can be seen at the Rooms of the AMERICAN GAS-LIGHT JOURNAL.

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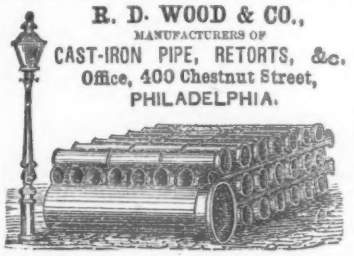

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J. DUNHAM, Esq, Pres. Norwich, Ct. Gas Co.
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THE AUBIN GAS-WORKS CO., OF ALBANY, N. Y., refer to the following Gas-Light Companies using their Works, to prove that Gas stocks can pay handsomely, and yet a rich and *cheap* Gas be made, viz.: Plattsburgh, Whitehall, Palmyra, Waterford, Bath, Amsterdam, Fort Plain, N. Y.; Rutland, Vt.; Flemington, N. J.; Smyrna and Dover, Del.; Jersey Shore and Pittston, Penn.; Greensboro and Salem, N. C.; Sorel, St. Hyacinthe, and Point Levi, Canada. Agents wanted to extend the sale of the Aubin Portable Gas-Works, unsurpassed for simplicity, safety and economy.

WHERE GAS-WORKS AND WATER-WORKS ARE WANTED.

We are now publishing regularly the names of the thirty thousand post-towns in the United States, so that builders of gas-works and water-works, and the various manufacturers, may see where are new openings for business. And as each post-master will receive several copies of the AMERICAN GAS-LIGHT JOURNAL, for distribution, the number thus circulated will probably exceed *Three Million Copies. What a chance for advertisers!*

POST-OFFICE TOWNS IN THE UNITED STATES,

ARRANGED BY STATES AND COUNTIES,

Showing where Gas-Works and Water-Works are Wanted.

KENTUCKY.

104 Counties, 915 Towns, 5 Gas-Works, 1 Water-Works.

(*Concluded.*)

Hickman County.

Baltimore, Columbus, C. H., New Texas,
Clinton, Moscow, Wesley.

Hopkins County.

Ashbysburgh, Clyde, Nebo,
Burnett, Day's Store, Providence,
Carlow, Hall, Slaughtersville,
Chalk Level, Little Prairie, Underwood,
Charleston, *Madisonville*, (c. h.) Vanderburgh.

Jefferson County.

Cedar Creek, Grassy Pond, Middletown,
Deposit, Hay's Spring, O'Bannon,
Falls of Harrod, Jeffersontown, Portland,
Fern Creek, Lacona, St. Matthews,
Fisherville, Long Run, Salina.
Louisville, (c. h.,)

Jessamine County.

Cogar's Landing, Keene, Pekin,
Hanly, Mount Freedom, Pott's Mills,
Jessamine, *Nicholasville*, (c. h.,) Sulphur Well.

Johnson County.

Hood's Fork, *Paintsville*, (c. h.)

Kenton County.

Covington, *Independence*, (c. h.,) Morning View,
Dry Creek, Kenton, Visalia.
Fowler's Creek, Latonia Springs,

Knox County.

Barboursville, (c.h.,) Cumberland Ford, Lynn Camp,
Clear Creek, Flat Lick, Yellow Creek.

La Rue County.

Buffalo, Magnolia, Uptonville.
Hodgensville, Salt Lick,

Laurel County.

Bush's Store, Mershon's Cross Roads,
Laurel Bridge, Middle Fork, White Lilly,
London, Rose Hill, Whippoorwill.

Lawrence County.

Blaine, Cherokee, Peach Orchard,
Bolton, Falls of Blaine, Prosperity,
Bolt's Fork, *Louisa*, (c. h.,) Warfield.
New Store,

Letcher County.

Cornett's Mill, Indian Bottom, *Whitesburgh*, (c. h.)

Lewis County.

Cabin Creek, Marine, Rock Creek,
Clarksburgh, (c. h.,) Martin's Fork, Tolesboro,
Concord, Poplar Flat, Vanceburgh.
Kinniconick, Quincy,

Lincoln County.

Crab Orchard, Hustonville, Walnut Flat,
Hall's Gap, Milledgville, Waynesburgh.
Stanford, (c. h.,)

Livingston County.

Berry's Ferry, Ross' Ferry, *Salem*, (c. h.,)
Carrsville, Smithland.

Logan County.

Adairville, Henrysville, Rabbitsville,
Baugh's Station, Hesper, Richlieu,
Escipion, Keysburgh, *Russelville*, (c. h.,)
Gordonsville, Logan Mills, South Union,
Hague, Volney.

Lyon County.

Eddyville, (c. h.,) Saratoga.

McCracken County.

Exchange, Massack, Woodville.
Paducah, (c. h.,)

McLean County.

Bremen, Livermore, Social Hill,
Calhoun, (c. h.,) Rumsey, Worthington.

Madison County.

Berear, Goochland, Prunty's Mill,
Big Hill, Joe's Lick, *Richmond*, (c. h.,)
Boonesboro', Kingston, Speedwell,
Doylesville, Kirksville, Union Meeting House,
Elliston, Menelos, White Hall.
Mill Grove,

Marion County.

Bradfordsville, *Lebanon*, (c. h.,) New Market,
Chicago, Loretto, Raywick,
Haysville, Manton, St. Mary's.

Marshall County.

Aurora, Birmingham, Olive,
Barksdale, Briensburgh, Palma,
Benton, (c. h.,) Fair Dealing, Watson's.

Mason County.

Dover, Maysville, North Fork,
Fern Leaf, Minerva, Orangeburg,
Germantown, Millwood, Sardis,
Helena, Mount Gilead, Slack,
May's Lick, Murphysville, *Washington*, (c. h.)

Meade County.

Brandenburgh, (c.h) Garrett, Rock Haven,
Flint Island, Garnettsville, Stapleton.
Meadville,

Mercer County.

Bohan, *Harrodsburgh*, (c.h.) Nevada,
Cornishville, McAfee, Pleasant Hill,
Duncan, Salvisa.

Monroe County.

Centre Point, Hilton, Rock Bridge,
Fleppin, Mud Lick, Sulphur Lick,
Fountain Run, *Tompkinsville*.. (c.h.)

Montgomery County.

Aaron's Run, Howard's Mills, Mount Ida,
Camargo. Levee, *Mount Sterling*, (c.h.)
Cash's Nob, Side View.

Morgan County.

Black Water, Grassy Creek, Licking Station,
Bloomington, Hampton's Mills, Little Sandy,
Caney, Hazle Green, Swiftville,
Cassity's Mills, Johnson's Forks, *West Liberty*, (c. h.,)
Christy's Fork, Woodlawn.

Muhlenburg County.

Airdrie, Laurel Bluff, Pond River Mills,
Earles, Lead Hill, South Carrollton,
Ellwood, Luro, Sulphur Springs,
Greenville, (c. h.,) Model Mills, Wickland.

Nelson County.

Bardstown, (c. h.,) Deatsville, New Haven,
Bloomfield, Fairfield, New Hope,
Boston, High Grove, Poplar Neck,
Chaplin, Nelson Furnace, Rolling Fork,
Cox's Creek, Wickliffe.

Nicholas County.

Blue Lick Springs, Forest Retreat, Moorefield,
Buzzard Roost, Head Quarters, Pleasant Valley Mills.
Carlisle, (c. h.,) Irvinesville, Weston.

Ohio County.

Beaver Dam, Ceralvo, Hines' Mills,
Briggs' Mills, Cool Spring, Pleasant Grove,
Buck Horn, Cromwell, Point Pleasant,
Buford, Fordsville, Tippecanoe.
Hartford, (c. h.)

Oldham County.

Ballardsville, Centrefield, Oldhamburgh,
Beard's Station, Floydsburgh, Pewee Valley,
Brownsborough, Goshen, *Westport*.
La Grange,

Owen County.

Dallasburg, Lusby's Mill, Poplar Grove,
Eagle Hill, Monterey, Rock Dale,
Gratz, New Columbus, Savern,
Harmony, New Liberty, Sparta.
Owenton, (c. h.,)

Owsley County.

Bear Creek, Gray Hawk, Proctor,
Beattyville, Green Hall, South Fork,
Boonville, (c. h.,) Maulden, Spruce Grove,
Devil's Creek, Traveller's Rest.

Pendleton County.

Aspen Grove, De Mossville, Meridian,
Callensville, *Falmouth*, (c. h.,) Morgan,
Catawba, Flower Creek, Motier,
Clayton, Gardnersville, Wright's Station.

Perry County.

Brashersville, *Hazard*, (c. h.)

Pike County.

Breckinridge, Elliottville, Piketon,
Democracy, Hamilton's Store, Robinson Creek.
Lonville,

Powell County.

Stanton.

Pulaski County.

Adams' Mills, Grundy, Thompsonville,
Cato, Line Creek, Waterloo,
Dabney, *Somerset*, (c. h.,) Waitsboro,
Dallas, Telico, Wightsville,
Dobbsville, Woodstock.

Rockcastle County.

Mount Vernon, (c.h.) Round Stone, Scaffold Cane.

Russell County.

Creelsburg, Jamestown, Royalton,
Horse Shoe Bottom, Mount Airy, Russell Spring.
Rowena,

Rowan County.

Farmers, Moorehead.

Scott County.

Georgetown, (c. h.,) Little Eagle, Ray's Fork,
Great Crossings, Newtown, Stamping Ground,
Griffee's Mill, Oxford, Turkey Foot,
Jones's, Payne's Depot, White Sulphur.

Shelby County.

Chesnut Grove, Crooper's Depot, *Shelbyville*, (c. h.,)
Christiansburgh, Finchville, Simpsonville,
Clay Village, Graefenberg, Six Mile,
Consolation, Harrisonville, Southville.
Jesse's Store,

Simpson County.

Franklin, (c. h.,) Galway, Temperance Mount.
Hickory,

Spencer County.

Elk Creek, *Taylorsville*, (c. h.,) Waterford,
Smileytown, Van Dyke's Mill, Wilsonville.

Taylor County.

Campbellsville, Mannsville, Saloma.

Todd County.

Allensville, Fairview, McLean's Mill,
Clifty, Graysville, Pilot Knob,
Daysville, Haddensville, Roscoe,
Elkton, (c. h.,) Trenton.

Trigg County.

Cadiz, (c. h.,) Empire Iron Works, Roaring Spring,
Canton, Golden Pond, Rock Castle,
Donaldson, Laura Furnace, Wallonia.
Lindsay's Mills,

Trimble County.

Abbottsford, Garriott's Landing, Milton,
Bedford, (c. h.,) Winona.

Union County.

Bordley, Curlew, *Morganfield*, (c. h.,)
Caseyville, Cypress, Raleigh,
Clay, Gum Grove, Uniontown.
Hentsville,

Warren County.

Alma, Green Castle, Polkville,
Bowling Green, (c.h.) Ingleside, Smith's Grove,
Claypool, Pleasantville, Temperance Hill,
Doughty's Creek, Woodburn.

Washington County.

Beech Fork, Mackville, *Springfield*, (c. h.,)
Beechland, Sharpsville, Texas,
Fredericktown, Willisburgh.

Wayne County.

Clio, *Monticello*, (c. h.,) North Hill,
Mill Springs, Newberry, Robertsport.

Whitley County.

Burk Camp Mills, Marsh Creek, Rockholds,
Clear Fork, Meadow Creek, *Whitley*, (c. h.,)
Craig's Ferry, Pine Tree, Wild Cat,
Lot, Woodbine.

Woodford County.

Dorsey, Mortonsville, Troy,
Midway, Munday's Landing, *Versailles*, (c. h.)
Spring Station,

COAL TRADE OF ENGLAND.—In 1860, France purchased 1,352,062 tons of coals, cinders, and culm from England. The other chief customers were—Denmark, 418,356 tons; Sweden, 214,729; Norway, 141,163; Russia, 356,496; Prussia, 399,175; the Hanseatic towns, 539,468; Holland, 315,931; Spain and the Canaries, 452,479; Italy, 465,275; Turkey, 196,504; India (including Singapore), 230,417; China (with Hongkong), 139,119; the United States, 309,869; Brazil, 169,568; British West Indies, 78,919; foreign West Indies, 175,557; British North America, 150,565 tons.

In the year 1860, 10,720,716 tons of coals, cinders, and culm were shipped coastways, from one port to another of Great Britain—an increase of 612,883 tons, over the year 1859; and 7,321,832 tons of the declared value of £3,316,281 were exported—an increase of 314,883 tons over 1859, and of £46,268 in value. In 1850 the quantity exported, was only 3,351,880 tons (less than half the export of 1860), the declared value of which was £1,284,224. But all these figures, relating to seaborne coal, deal with not very much more than a quarter of the total quantity raised; the bulk of it is brought into consumption without being shipped, and manufactures and population are attracted to the neighborhood of the coal-fields. The quantity of coals brought into London in 1860 coastways was 3,573,377 tons (an increase of 274,207 tons over 1859), and by inland navigation and land carriage 1,499,899 tons (an increase of 289,123), together 5,373,276 tons. Ten years ago the quantity was only 3,638,883 tons.

PERFUME VAPORIZER—The London *Builder* mentions that a simple apparatus capable of being made very useful as a sanitary agent, as well as for the diffusion of merely pleasant odors through apartments, hospitals, halls, theatres, &c., has been invented by Mr. E. Rimmel, the well-known perfumer. It consists of a vessel heated by a small lamp below it, and intended for the vaporization of steam impregnated with the odors of flowers, aromatic vinegar, or other acids, and sanitary agents, such as chlorine, ammonia, &c. Even some perfumes are believed to act not merely as ministrants to luxury or pleasure, but as sanitary agents, by, it is believed, ozonizing the oxygen of the atmosphere, and so converting it into true vital air. Dr. Hassall, Dr. Letheby, and others recommend the apparatus as a useful sanitary agency.

WATER-WORKS OF BERLIN, PRUSSIA.—The Berlin Water-Works now supply 8,000 of the 80,000 families in the Prussian capital. During the severe weather of the present winter, the thermometer standing at 10 deg. below zero, and the ground frozen to the depth of three feet two inches, the temperature of the water supplied was thirty-six degrees.

EXPERIMENTS WITH TURBINE WATER-WHEELS.

A very interesting series of experiments, with several different varieties of Turbine water-wheels was made at the Fairmount Water-Works, Philadelphia, during 1859–60. As this species of wheel is attracting much attention from water companies, manufacturers, &c., who depend upon water as a motive-power, we present a few extracts from the official report of the chief engineer, Mr. Birkinbine, accompanied with illustrations of the most effective wheels, and some remarks as to their working power.

It may be well to remark that these experiments were made by the direction of the water committee of the councils of Philadelphia, and were conducted under the immediate superintendence of Mr. Birkinbine.

We also give an illustration of the apparatus used for testing the models.

The large box C, forms a reservoir for supplying the models with water; it communicates with the penstock D, by way of the trunk P, and has a waste notch adapted to it, for preventing overflow of the box. The valve *p*, operated by the lever R, having its fulcrum in the post S, opens and closes the communication with the trunk and reservoir, at the pleasure of the operator.

The models to be tested were placed in the box F, which served as a wheel pit, with their inlet water-ways connected directly to the side of the penstock D. Those wheels which had no gates of their own, were provided with one at the opening of the penstock into the inlet of the wheel. After the water had performed its work in the wheels, it flowed into the box F, and escaped through the notch *f*, into the trough G, by which it was either conveyed from the apparatus into the river, or conducted into the measuring box L, through the spout K.

When the discharge valve J was open, any water passing down the trough fell into the measuring box; but when the valve was shut, the water passed over its back and was delivered outside. This valve was operated by the rod *j* extending through a slit in the top of the trough, the side of which is removed to show the arrangement.

The measuring box L is emptied through the opening M, by drawing the slide N, and has a graduated glass tube O fitted to its side, for exhibiting the exact depth of the water within.

To the top of the penstock D was fitted an overflow spout E, for carrying off any excess of head of water from the models, it being important to maintain an unvarying head over them. The perpendicular distance between the summit *e*, of the overflow E, and the notch *f*, was six feet.

The shaft of each model was connected by suitable gearing to the shaft of the drum T. Upon this drum was wound a rope, which, passing over the sheave B, revolving in bearings at the tops of the posts AA, lifted the weight-box H.

The posts AA, were held in position by guys, which extended back and were fastened on the upper level of the wall.

The whole apparatus was supported on and connected with the framing UU, VW, XY, and Z.

The box C received a constant supply of water, through pipes connected with one of the pump mains.

The measuring box was five feet every way inside.

The apparatus is Isometrically represented to a scale of one-eighth of an inch to the foot.

The height of the wall against which the apparatus stood is fifteen feet.

OPERATION.

After the model to be tested was properly connected with the penstock D, and drum shaft T, the reservoir C was filled with water, and kept constantly supplied to the point of overflow.

The weight box H was then charged and carefully weighed, and the valve J thrown upon its seat, to pass the water outside the measuring box. This valve was operated by an assistant, whose business it was to open and close it promptly, when the signals were given.

An assistant was stationed at the lever R, to control the valve *p*, and keep the water in the penstock, during the experiment, just at the point of overflow.

The rope was well stretched before it was used, and during the course of the experiments two pieces of tape were fastened around it, at a convenient distance apart for observation (usually 25 ft.), which distance was measured when the whole weight of the loaded box was suspended. Before trial, the box was raised and lowered several times by running the wheel, to ascertain that all the machinery was properly adjusted and to give the rope every opportunity of becoming fully stretched for the trials. The distance between the tapes was again measured, and frequently also during the trial, to enable the operators to eliminate every possibility of error from the stretching or contracting of the rope.

When the wheel was fully under weigh, and at the moment the first tape was passing a fixed point, a signal was given to open the discharge valve and direct the tail water into the measuring box; when the second tape was passing the same point, another signal was given to close the valve, and conduct the tail water away from the apparatus; after which the wheel was stopped and the weight-box allowed to run back to the place of starting.

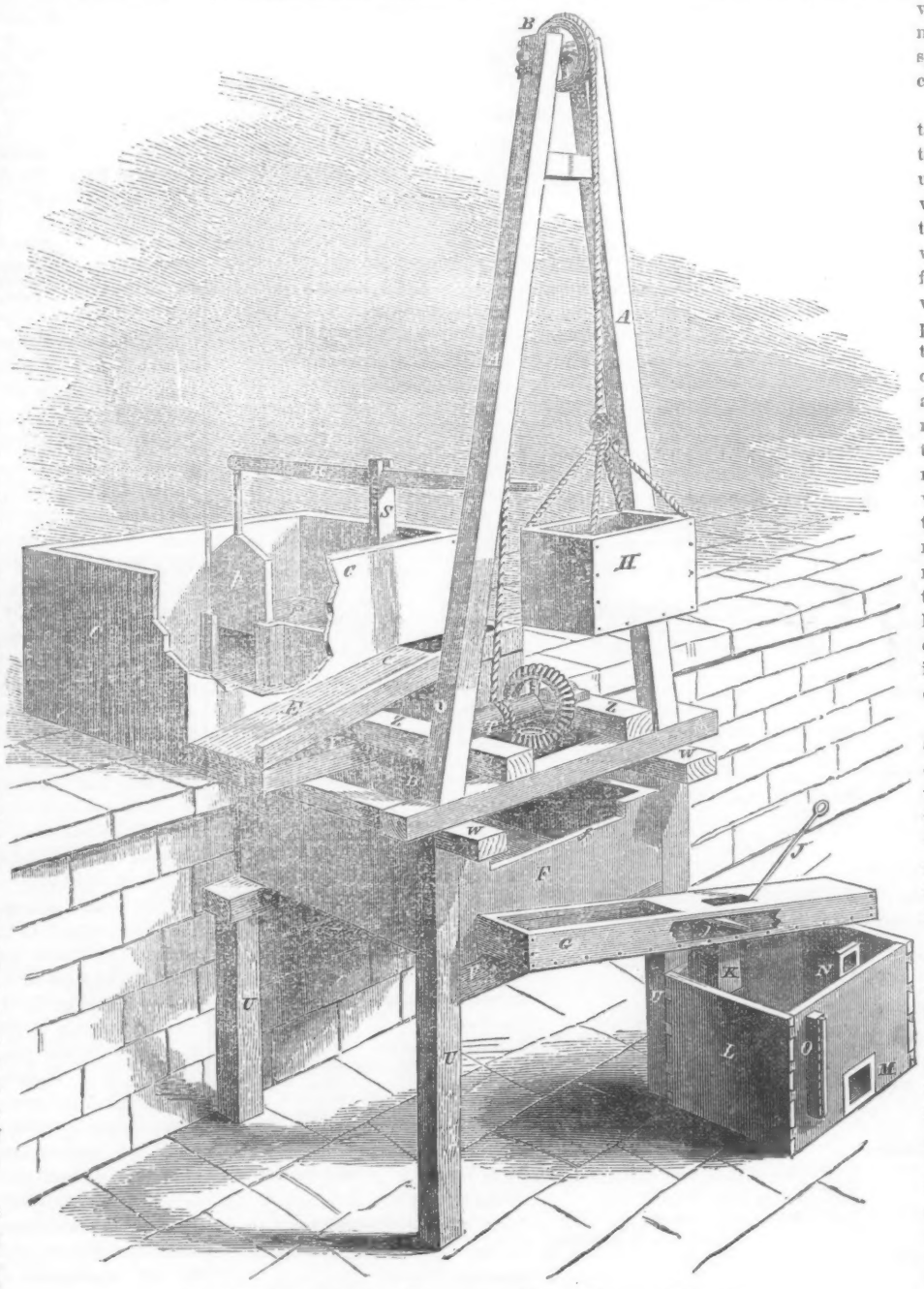
If the depth of overflow from the top of the penstock varied in any experiment, or in different experiments, the operator at the inlet valve noted the amount of variation from observations made at the summit of the spout, and allowed for it accordingly.

An adjustable slide was fitted to the notch *f*, to enable the operator to maintain a uniform overflow of the tail water from the wheels. Upon the surface of the water in the wheel-box F rested a float, from which projected a rod vertically to the top of the penstock; this rod exhibited to the operator above the level of the water in the wheel box, and served as a check to any neglect of duty on the part of the operator at the adjustable notch *f*. For wheels which vented water more rapidly than others, the adjustable notch and float indicator were necessary to ascertain the actual difference of level of the head and tail water, during every trial; which difference is the *true* head or fall, acting on any water wheel.

It will be noticed that the amount of water which escaped from the wheel during the experiment, into the measuring box, was only that which was used to raise a *known weight* a *measured height, after* the wheel had attained a uniform speed.

It is reasonable to assume that the amount of water required to start different wheels may vary very considerably; and it is possible that a wheel which gives a higher ratio of useful effect while in motion, may require more water to get it under weigh than one which gives a lower ratio. It is also certain that at the commencement of the trials the rope would be drawn to different tensions; perhaps, in some instances, it would hang loosely from the sheave, in which case the wheel would vent a great deal of water before the weight would be lifted at all. It was to avoid errors from these sources that the apparatus was constructed in the manner described; to ascertain the useful effect of each wheel, *only while in motion and during the performance of its work*; omitting altogether the uncertain conditions of starting and stopping.

The different parts of the apparatus were so disposed that the observer at the penstock overflow could see the level of the water in the wheel-box, as indicated by the float-rod; and the observer stationed to signal the passage of the tape over the measuring point could, by his ear, note the time of closing and opening the discharge valve, and make allowance, if necessary, for any fore or after movement which might unavoidably



No. 1.—Apparatus for Testing the Model Turbine Wheels.

occur while closing it. This observer was at the same time within sight of the flont rod and penstock overflow, and in the interim of tape transits, could detect, at a glance, the height of head under which the wheel was working. In this manner, one observer could watch the performances of the others, and act as a check to any neglect of duty on their part; and any person interested in the correct testing of the wheels, could see the ropes, water-levels, and discharge valve, from one station point, and thus observe for himself the faithfulness of the operators and the progress of the trials. The time required for each wheel to perform its work was taken by an observer, who stationed himself on the upper platform, at a point favorable for observing the exact moment of transit of the tapes.

During the whole course of the experiments the same persons gave the same signals and operated the same parts of the apparatus, and no pains were spared in securing the greatest degree of exactness in every manipulation of the machine.

The amount of weight to which the box was loaded was varied in different experiments; these weights, together with all the essential data of the trials, appear in the tables which are given under the head of each wheel. A correct platform scale for weighing the box was kept at the apparatus during the whole time of the experiments, and any person who wished to be satisfied of its correctness before trying his wheel, could have it tested upon making that wish known.

EXPERIMENTS.

GEYELIN'S DOUBLE JONVAL WHEEL ON A HORIZONTAL SHAFT.

Geyelin's first series of trials was made with two wheels, secured on a horizontal shaft. The head-water was admitted between the fixed wheels, and escaped horizontally outwards through the movable wheels into discharge tubes, which were submerged in the tail water in the same manner, and for the same purpose as in the case of the single wheels hereafter described. The arrangement and general design of the wheels and cylinders, and the curvature of the guides and buckets, were similar to those of the single wheel on a vertical shaft.

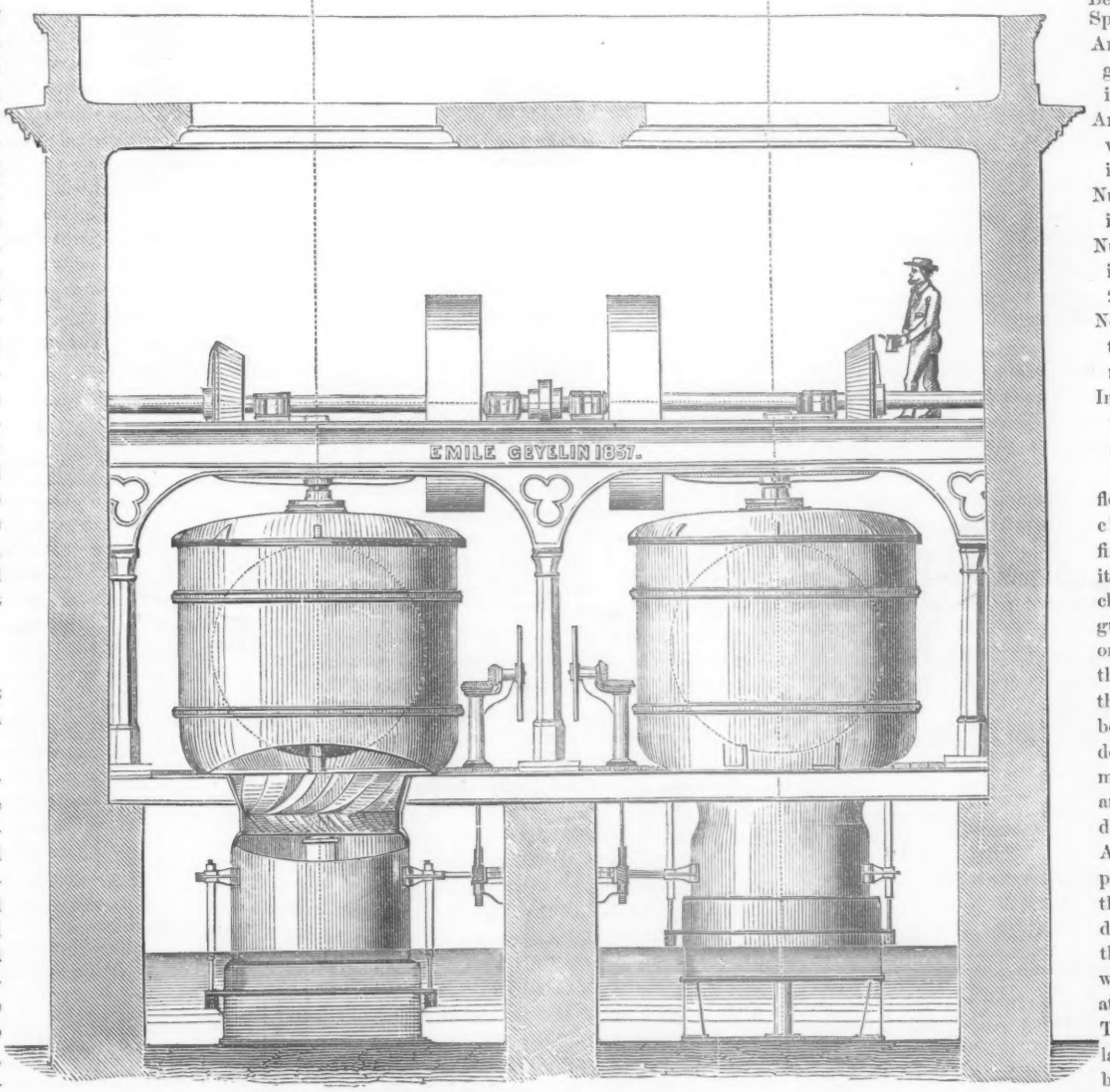
Table No. 1 exhibits the results with this arrangement.

A high percentage was not claimed for the double Jonval wheel; the trials with it were regarded altogether as experimental in their nature, with a view to ascertain the comparative merits of the two systems, when wheels, in every way similar to each other, were used under similar circumstances; that is, two wheels on a horizontal shaft compared with one wheel, of about the same power, on a vertical shaft, and under the same head.

JONVAL TURBINE BY GEYELIN.

In the official report of these experiments diagrams are given showing various sections of this wheel, drawn to a scale, and exhibiting the several parts disconnected. We have no space for the publication of the large plate, and consequently were obliged to omit it in our abstract. The buckets were fastened in the movable wheel, to the central part, or hub, and were bound around their outer edges by a wrought iron band.

The wheel thus constructed was secured to the shaft turned off truly on its upper face and outer edge, and fitted to run freely under the fixed wheel, and within the cylindrical part of the casing. The guides were firmly secured to the outer face of the fixed wheel, and fitted closely against the conical sides of the upper part of the casing. The shaft revolved freely through the top plate of the fixed wheel. The part of the casing in which the fixed wheel rested, and the cylindrical part in which the movable wheel turned, were bored out truly, and the under edge of the hub where it meets the corresponding rim of the movable wheel, was faced off, so that the movable wheel could run nearly in contact with it.



JONVAL TURBINE BY E. GEYELIN.

No. 1.

GEYELIN'S FIRST SERIES OF TRIALS.

NOTES OF TRIALS OF JONVAL TURBINE (DOUBLE VERTICAL) BY E. GEYELIN, NOV. 9, 1859. HEIGHT 25 FT. HEAD 6.04 FT.

No.	Weight raised.	Water in box.	Time in seconds.	Ratio of useful effect.
1	700 lbs.	3.31 feet.	20	.5633
2	800 "	3.52 "	22	.6054
3	900 "	3.76 "	24	.6376
4	1,000 "	4.02 "	25¼	.6626
5	1,100 "	4.31 "	28	.6799
6	1,200 "	4.72 "	30	.6772
7	700 "	3.283 "	21	.5680
8	600 "	3.126 "	20	.5112
9	500 "	2.966 "	19	.4490
10	wheel held fast,	3.42 "	20	
11	" running free.	3.335 "	20	

Ratio of gearing,
Bevel 50 to 144 } 25 to 288.
Spur 6 " 24 }

Area of orifices in both fixed wheels, 42.6 sq. in.
Area of orifices in both movable wheels, 42 sq. in.
Number of buckets in each fixed wheel, 9.
Number of buckets in each movable wheel, 28.
Note.—In trial No. 11, the drum made 13½ revolutions.

No. 2.

GEYELIN'S SECOND SERIES OF TRIALS.

NOTES OF TRIAL OF JONVAL TURBINE (HORIZONTAL) BY E. GEYELIN, FEB. 29, 1860. HEIGHT RAISED 25 FT. HEAD AND FALL, 6 FT.

No.	Weight raised.	Water in measuring box.			Average.	Time in sec'nds			Ratio of useful effect.
1	900 lbs	2.96 ft.	3.02 ft.	2.96 ft.	2.98 ft.	22	25	21	.8099
2	950 "	3.18 "	3.06 "	3.10 "	3.113 "	25	24	25	.8183
3	1,000 "	3.25 "	3.32 "	3.23 "	3.266 "		26	26'	.8210
4	1,050 "	3.54 "	3.46 "	3.46 "	3.486 "	27	28	27	.8077
5	1,100 "	3.67 "	3.60 "	3.63 "	3.633 "	26	27	28	.8119
6	1,150 "	3.84 "	3.73 "	3.82 "	3.80 "	30	29	30	.8124
7	1,200 "	4.02 "	4.05 "	4.01 "	4.03 "	31	31	31	.7993
8	1,250 "	4.25 "	4.32 "	4.21 "	4.26 "	32	33	33	.7868
9	1,300 "	4.51 "	4.39 "	4.56 "	4.49 "	34	33	34	.7771
10	1,000 "	3.87 "				30			.6928
11	Wheel held fast,				4.52 "	30			
12	" running free.				3.98 "	30			

Ratio of gearing,
Bevel, 1 to 2¼ } 7 to 60.
Spur, 7 to 24 }
Area of orifices thro' guides, 44.6 square inches.
Area of orifices thro' wheel, 37.7 square inches.
Number of buckets in fixed wheel, 10.
Number of buckets in movable wheel 26.
Notes.—In trial 12, the wheel made 20 revolutions.
In trial 10, the gate was only partly raised.

The head water flowed freely into the chamber over the fixed wheel, whence it passed into the chutes formed by the guides, and acted upon the buckets of the movable wheel, the curves of which being in reverse order, received the most effective blow and pressure of the discharging water. After the water had performed its work in the wheel, it escaped downwards through the discharged tube, which was a continuation of the cylinder. This tube was enlarged immediately below the wheel, to give the escaping water an unobstructed flow, and was submerged in the tail water, to secure the power of the suspended column of water below the wheel, forming a draft tube.

This wheel, in common with all wheels where the draft tube is used, occupies a mid-position between the head and tail water; when the former was shut off, the suspended column of water sunk to a level with the latter, and left the wheel in a favorable position for examination and repairs.

Should any solid body pass between the buckets and guides, which would endanger the breakage of either, while the wheel is in motion, the guide wheel being fitted loosely into the conical part of the casing, would be raised and let the obstruction pass out without doing injury. This peculiarity also permits the raising of the movable wheel, when the step, or any of its parts, needs repairing, and obviates the necessity of taking the wheel apart.

In the diagram published in the report the dimen-

sions are given of the template, which was fitted to the guides of the the model, against the outer circumference of the hub, and the ordinates to the curve at every tenth part of the whole space occupied by the curve, equal to 8.55 inches.

In the lower part of the diagram are given the ordinates of the bucket curve of the movable wheel for every tenth part of the whole curve space. The template from which the bucket curve was taken was formed to suit the curve of the bucket against the inner surface of the ring which encircles the whole wheel. The guides and buckets project radially from the hubs of the wheels.

The model was very nicely and truly fitted up. The cylinder, gate, base-plate and wheel centres were made of cast iron; the shaft, of two-inch wrought iron, running on a steel step, about five-eighths of an inch in diameter; the guides and buckets were made of sheet brass, correctly and uniformly shaped to the proper curves; the former were about one-eighth, and the latter one-sixteenth of an inch in thickness. Its proportions and finish were well designed and executed, and leave nothing to be desired to make it a perfect model of this type of turbines.

Table No. 2 exhibits the results of trials with this model. The average useful effect given by this series of trials is .8049.

The contract for the new wheels for the Fairmount Water-Works was awarded to Mr. Geyelin. The following letter from Mr. Birkinbine explains the reasons for this action of the department:

DEPARTMENT FOR SUPPLYING THE CITY WITH WATER,
Philadelphia, April 5th, 1861.

EMILE GEYELIN, Esq.:

Dear Sir,—The following are the reasons that influenced the department in awarding you the contract for furnishing the Jonval Turbine water-wheels for working the new pumps at the Fairmount Water-Works:

First.—The fact that your model gave the best average percentage over all others brought into competition.

Second.—The durability and continued satisfactory operation of your Jonval Turbine, erected at the Fairmount in 1851.

Third.—The general and highly competent evidence brought before the Committee of your ability as a constructor of Turbine wheels.

Fourth.—The fact of your estimate of cost being considerably lower than that of any other party.

Yours, respectfully,
HENRY P. M. BIRKINBINE,
Chief Engineer.

JONVAL BY STEVENSON.*

No. 3.

STEVENSON'S FIRST SERIES OF TRIALS.

NOTES OF TRIALS OF JONVAL TURBINE, BY J. E. STEVENSON.

No.	Weight raised	Height.	Water in meas. box.	Time in sec'ds.	Head and fall.	Ratio of useful effect.
1	900 lbs.	25 ft.	3.520 ft.	26	6 02 ft.	.6833
2	1,000 "	"	3.816 "	29	"	.7004
3	1,050 "	"	3.926 "	29	"	.7148
4	1.100 "	"	4.053 "	30	"	.7254
5	1,150 "	"	4.190 "	31	"	.7335
6	1,200 "	"	4.420 "	33	"	.7256
7	1,250 "	22 "	4.076 "	30	"	.7213
8	1,300 "	22 "	4.346 "	32	"	.7035
9	1,350 "	20 "	4.166 "	31	"	.6929
10	Wheel held fast,		4.58 "	30	"	
11	" running free,		4.39 "	30	"	
					Average,	.7112

Ratio of gearing.

Bevel, 17 to 69, } 187 to 1406.
Spur, 44 " 96, }

Area of orifices through guides, 41.25 square inches.
" " " wheel, 30.9 " "
Outside diameter of wheel, 21 inches.
Inside " " 15.5 "
Number of buckets in movable wheel, 18.
" " fixed wheel, 12.
Depth of movable wheel, 5.25 inches.
" " fixed " 5 "
In trial 11, the drum made 18 revolutions.

*The Messrs. W. G. & J. Watson, of Paterson, N. J. claim to be the designers, constructors, and owners of the wheels designated by Stevenson's name, and also claim that their name should be inserted throughout the report in place of that of Stevenson.

(*First Model.*)

In Stevenson's first model, the guides were not bent down at their lower ends, as shown in the description of the second, but the lower edge of the band of the movable wheel was flared; and the water-ways in the fixed wheel narrowed to the point of discharge. The movable wheel had eighteen buckets, the fixed wheel twelve guides, and the forebay had a partition projecting from one side to near the shaft, to prevent gyration of the head-water, which entered the forebay in a radial direction towards the centre of the wheel-shaft.

The results of the trials are shown in table No. 3.

(*Second Model.*)

This Jonval model, by Stevenson, was similar to Geyelin's in principle, but different in the arrangement of its details. In the diagram referred to is a vertical section of the movable and stationary wheels, as arranged when it gave the second series of trials, in which is shown the relative positions of the fixed and movable wheels, and the shaft to which the latter is secured. The buckets were bound to the hub by a thin wrought iron band, as in Geyelin's, and were additionally secured by two small square bands outside. A flange projected from the movable wheel, within the rim of the fixed wheel, and formed against it a water-tight joint.

The guides were doubly bound to the hub of the fixed wheel, in the same manner as the buckets of the movable wheel. The fixed wheel was secured in a groove turned in the floor of the forebay, into which it projected.

The step-box was adjusted laterally by radial screws, which passed through lugs on the centre-plate of the spider beam, and rested on a ring which was fitted into the central aperture of the latter. This ring was adjusted vertically by a large taper key, which extended under it and across the central aperture. If the radial screws were slackened and the key withdrawn, the ring and step-box could be lowered through the central aperture, and repaired, without raising or disturbing the wheel, after which it could be replaced with little trouble.

A circular chamber bolted fast to the centre-plate of the spider beam surrounded the step-box and extended above the bearing; a spout led from the side of the discharge tube into this chamber, for the purpose of keeping the chamber constantly filled with water.

This wheel had a discharge or draft-tube extending beneath the surface of the tail water, in the same manner as Geyelin's, and was fitted with a gate, which consisted of a circular disc of the same diameter as the tube, supported on a horizontal axis, by which it was operated from the outside.

Beneath the floor, of the forebay, projected a flange, within which the upper band of the movable wheel freely revolved. This flange and another allowed the movable wheel to be lowered without loss of water at the joints of the flanges with the wheel. This arrangement permitted experiments to be made with the wheel at different distances from the guides.

The head-water entered the forebay in the direction of a tangent, thus favoring gyration in its motion over the chutes or guide curves, which, in the first model, was prevented by a partition in the forebay.

In the diagram are shown the guide and bucket curves of the model, drawn to a scale of one-tenth the full size. The dimensions were taken from templates fitted to the guides and buckets on the inner surfaces of the bands which encircle them.

In the fixed wheel there were twelve guides, and in the movable wheel nineteen buckets. The top edges of the guides were radial lines, and the lower edges were tangent to a circle 6 inches in diameter, concentric with the wheel, as shown by the lines I, fig. 1. The top edges of the buckets were tangent to a circle with a diameter equal to one and a half inches, and the bottom edges were radial lines; all the tangents were on the same side of the axis.

The lower edge of the band which encircled the buckets of the movable wheel was flared outwards, to give the water (in the opinion of the maker) "a free discharge from the wheel, and at the same time diminish friction, secure the action of centrifugal force upon the incline of the band, and give thereby additional power to the wheel."

In this wheel the guide curve is bent downwards at its lower end, causing the space between the curve and the dotted line (which latter is a guide curve advanced on the wheel) to widen towards the point of discharge.

This change of curvature deflects the direction of the discharge at a greater angle with the plane of the wheel.

These were strong, practical working models, 22 inches in diameter, with brass buckets, well finished. Every part was well and truly fitted; the "toe" of the shafts revolved upon *lignum-vitæ* steps about two inches in diameter, the same as that of their shafts; all of the machine work was done in the best manner.

It will be noticed in table No. 4, that the model gave its highest result in the twelfth trial, the first one made after the wheel was lowered from the guides; but in the next two trials it shows a decided *loss* when compared with the third and fourth trials, which were made under like circumstances, or nearly so, before the wheel was lowered from the guides.

It further appears, that on the next day, when three trials were made, the second of which was under circumstances precisely similar to those of the twelfth trial on the day previous, a falling off of 3.4 per cent. occurred, and the third trial failed by 1.6 per cent. to equal the fifth, with the same weight to lift as on the previous day, when the wheel ran close to the guides.

Reference to Stevenson's first series of trials, table No. 3, will show an average ratio of useful effect of .7112, which is considerably below .8485, the average of the second series. The average of both series taken together is .7798.

No. 4.

STEVENSON'S SECOND SERIES OF TRIALS.

NOTES OF TRIALS OF JONVAL TURBINE, MARCH 9, 1860. THE WEIGHTS WERE ALL RAISED 25 FEET.

No.	Weight raised.	Water in measuring box.			Average	Time in seconds.			Head and fall.	Ratio of useful effect.
1	750 lbs.	2.36 ft.	2.40 ft.	2.36 ft.	2.373 ft.	20	20		6 ft.	.8475
2	800 "	2.57 "	2.53 "	2.46 "	2.52 "	20	20½	20	"	.8512
3	850 "	2.72 "	2.64 "	2.61 "	2.656 "	22	22	21	"	.8582
4	900 "	2.83 "	2.78 "	2.78 "	2.796 "	23	23	23	"	.8632
5	950 "	2.97 "	2.90 "	2.98 "	2.95 "	25	25	25	"	.8635
6	1,000 "	3.17 "	3.12 "	3.10 "	3.13 "	26	26	26	"	.8567
7	1,050 "	3.50 "	3.34 "	3.58 "	3.456 "	27	28	28	"	.8147
8	1,100 "	3.79 "	3.77 "	3.71 "	3.756 "	30	30	30	"	.7853
9	1,050 "	3.31 "	3.28 "	3.26 "	3.283 "	26	27	27	"	.8372
10	1,000 "	4.81 "			4.81 "	40			"	.5575
11	975 "	3.15 "	3.05 "	2.98 "	3.06 "	26	25	25	"	.8544
12	925 "	2.78 "	2.83 "	2.87 "	2.826 "	23	24	24	"	.8777
13	900 "	2.88 "	2.79 "		2.835 "	23	23		"	.8513
14	875 "	2.73 "			2.73 "	22			"	.8593
15	wh'l h'ld	4.29 "			4.29 "	30			"	
16	" free.	4.51 "			4.51 "	30			"	

NOTE.—IN THE LAST FIVE EXPERIMENTS THE WHEEL WAS LOWERED 1¼ IN. FROM THE GUIDES.

MARCH 10th, 1860.

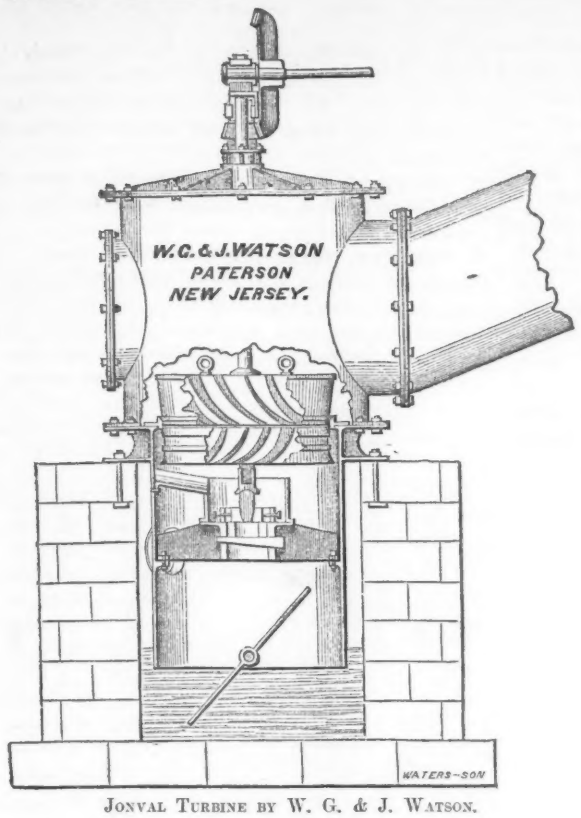
1	900 lbs.	2.76 ft.	2.82 ft.	2.79 ft.	2.79 ft.	23	23	24	6 ft.	.8650
2	925 "	3.01 "	2.91 "	2.90 "	2.94 "	24	24		"	.8437
3	950 "	3.04 "	3.00 "	2.98 "	3.006 "	24	24	24	"	.8475
4	wh'l h'ld	4.20 "				30			"	
5	" free,	4.22 "				30			"	

Omitting the 10th trial, the average is .8485

Ratio of gearing, { Bevel, 17 to 69, / Spur, 60 " 96, } 85 to 552.

Area of orifices through guides, 42 square inches.
" " " " wheels, 32 " "
Number of buckets in movable wheel, 19.
" " fixed " 12.
Depth of movable wheel, 5.125 inches.
" fixed " 5.75 "
Depth of buckets in movable wheel, 4.937 inches.
" " fixed wheel, 5.75 "
Mean diameter of movable wheel at lower edge, 18¾ inches.
Top edges of buckets of movable wheel are tangent to *a*; circle, 1¼ inches diameter.
Bottom edges of buckets in movable wheel are radial lines.
Top edges of buckets in fixed wheel are radial lines.
Bottom " " " " tangent to a circle 6 inches diameter.
In trial No. 10, the gate was partly closed.

A cut of this wheel as made by Messrs. W. G. & J. Watson, of Paterson, N. J., is here inserted.



Jonval Turbine by W. G. & J. Watson.

The description of Stevenson's models given above apply to this cut, it being a representation of the wheel experimented upon. A letter from the Messrs. Watson is here inserted :—

Paterson, N. J., February 4, 1861.

To H. P. M. Birkinbine,

Chief Engineer, Water Department, Philadelphia:

Dear Sir,—Reverting to the experiments on turbine water-wheels, made at your Works at Fairmount, we beg to assure you that the models exhibited by J. E. Stevenson were constructed by us at our expense and upon our own plans; they were also erected at our own cost, and that he acted in the matter only as our agent. * * * * * *

We are anxious to be fairly represented in your forthcoming report, and also to have the merit of our model certified to by you, as was your original intention, but which, unfortunately, a faithless agent perverted and appropriated to his own uses, by securing the testimonial in his own name.

We are, most respectfully, yours,

W. G. & J. Watson.

The following diagram shows the relative efficiency of several wheels by different makers, in which a marked variation is apparent:

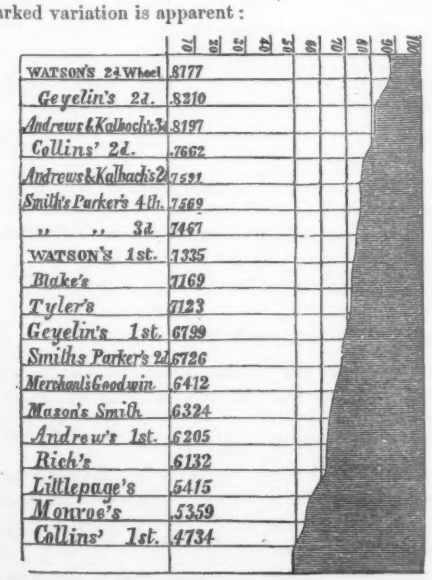


Diagram showing the Relative Capacity of Wheels by Various Makers.

Enameling Iron Pipes.—Among the important uses to which the enameling process has yet been applied, is that for securing both the internal and external surfaces of iron pipes from the corroding action of fluids. The principle involved in this improvement would seem to be of considerable importance to hydraulic engineers; for it has been found in practice, where pipes so prepared have been laid down, that the water delivered has retained its original purity, nor does it even deteriorate by long standing; the pipes are also found to last much longer than they otherwise would.—*Railway Review.*

The New Patent Law.—The new Patent Law is working very satisfactorily. The change comes quite opportunely, as only $15 is now required to be paid on presenting an application. The abolition of the excessive fees heretofore required of foreigners will do much to stimulate the introduction of many valuable inventions into this country, and protect them against unscrupulous pirates who lay violent hands upon everything within their reach.—*Ibid.*

Percussive Action of Gases.—It is stated that if fulminating mercury be laid on a block of iron and exploded, it will indent the iron. If this be a fact, it demonstrates, in a striking manner, the instantaneous or percussive action of gases.

Loss of Theoretical Effect of Pumps.—Pumps do not lift an amount of water equal for each stroke to that which would fill the pump barrel. Moderately good pumps lose 50 per cent. of the theoretical effect, and bad pumps as much as 80 per cent.

The Elegant Gas-Lamps and Fountain at King's Lynn, Norfolk, England.—Mr. John Malam, the enterprising proprietor of the gas-works, at King's Lynn, has presented to that town a superb column, supporting a cluster of gas-lamps, combined with a free drinking fountain, the description of which is extracted from the Lynn *Advertiser* of February 16, 1861. The gift was promised by Mr. Malam so long ago as the mayoralty of Mr. Smetham, in 1858, and the delay has been occasioned by the determination of Mr. Malam, and of his resident manager, Mr. Almond, (on whom the arrangements have mainly devolved,) that the column should be at once as original and as handsome as could possibly be obtained. It might perhaps have been completed in a quarter of the time and at a quarter of the expense if any existing model had been adopted, either wholly or in part; but the design is entirely new, and we are informed that there is not its like nor its equal in the United Kingdom. Whilst its cost to Mr. Malam will no doubt exceed 300*l.* sterling, the proprietors of the Thorncliffe Iron Works (where it was executed) will probably reap no immediate profit, but quite the contrary. They, in fact, regard it as a specimen work, to which they may refer as an instance of what they can accomplish; and they will look for remuneration to the orders which it may bring them from other towns. The modelling (which was executed under the care of Mr. Depledge, the designer at the Thorncliffe Works) cost 130*l.* in wages alone, irrespective of material; but the model once made, of course any future castings from it after the first, could be made at a comparatively small expense. The design consists of a tall and handsome column supporting a cluster of four elegant gas-lamps, viz., one central elevated lamp and three others on arms at a lower elevation. The height from the ground level to the bottom of the upper and centre lamp is 26 feet 6 inches. The upper and principal portion of the column is a fluted pillar or shaft, tapering gracefully upwards, and terminating in a foliated capital. Above this is the ornamental support for the centre lamp, and from it extend the branches or arms of flowing scroll-work to support the other three lamps. The lower extremity of the shaft is embedded in foilage similar to that of the capital, and stands on a large and handsome square base which forms a very striking feature of the design. It is most elaborately ornamented with foliage and scroll work, in the centre of which on each face is a large escutcheon. Three of these escutcheons bear the arms of the town, and the fourth the following inscription: "Presented to the town of King's Lynn by John Malam, Esq., in the mayoralty of John O. Smetham, Esq., 1858." The corners of the base are splayed off, and attached to each of the minor faces of the base thus formed is a very elegantly, yet boldly, designed figure of a pelican (the familiar crest of the town arms), about 16 inches in height. These are a great addition not only to the appearance but to the use of the column, as from the bill of each pelican flows a stream of water into an enamelled basin beneath. This combination of lamp, pillar, and fountain in one design is a beautiful and original idea, and one that will be appreciated, especially on market days. The overflow from the basins passes away invisibly through the interior of the column into the drain beneath. The base stands on a substantial platform of stone-work, 15 feet wide, 18 inches above the roadway, and approached by two steps 12 inches broad. As the weight of iron in the casting amounts altogether to about five tons, adequate provision has been made for its support by a solid foundation of brick-work, sunk a considerable depth in the ground. The coloring of the iron work is green bronze throughout. The form of the lamps was the topic of much discussion; but it was Mr. Malam's determination not to spoil the column by any mean or common-place termination; and globular ground glass lamps were therefore decided upon. They are 20 inches in diameter, and are, it is believed, the first of their kind on such a scale. Considerable inquiry was necessary in order to find a glass factory possessing the necessary appliances for turning out globes of this size; but this was at length accomplished, and there will now be no difficulty in obtaining duplicates to any extent in case of accident to the lamps. We cannot conclude this notice without expressing our sense of the great obligation of the town to Mr. Malam for so handsome and liberal a gift, and to Mr. Sampson Almond for the great expenditure of time and anxiety on his part in order to bring the business to a worthy and successful issue; nor without stating our belief that in conception and execution the work is an admirable one, and redounds greatly to the credit of all parties concerned in it. The name of this beautiful and costly work is The Tuesday Market Lamp and Fountan, of which Mr. Almond has favored these rooms with a drawing, and also a photogram of the Market Place and Column.

Charge of Stealing Gas in England.—At the last Durham Easter Sessions, Thomas Helsop, a butcher, of Bishopwearmouth, was charged with having stolen a quantity of gas from the Sunderland Gas Company. The prisoner had been for some time a customer of the Company, but not having paid up his arrears of gas, the pipe was cut off in June of last year. On the 3d of April the collector of the Gas Company found gas burning on the prisoner's premises, and it was discovered that the prisoner had connected a feed-pipe with the Company's service-pipe, and had for some time past been burning gas from nine lights in the prisoner's shop and a public house which he occupies. The defendant admitted the charge made against him of stealing the gas, but said the Company were to blame for not having allowed him to pay what he owed them by instalments. The prisoner was found guilty and sentenced to six months' imprisonment.

Glass Gauges for Oil Lamps.—In filling a metal lamp, the oil is liable to be spilled by running over the top, because it is so difficult to judge of the exact rise of the fluid by looking downward into the small opening. A remedy could easily be provided for this evil in the use of a small glass gauge, fitted into a recess in the side of the lamp, so as to indicate the exact height of the oil. Metal lamps are not liable to be broken like those made of glass, but the latter are preferred by many who would otherwise choose the former, for the simple reason that, in filling them, they can witness the rise of the fluid, always preventing its overflow.—*Scientific American.*

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PROPRIETOR, JOHN B. MURRAY. | EDITOR, C. ELTON BUCK.

SATURDAY, JUNE 15, 1861.

The new theory of the composition of steel, as announced by M. FREMY before the French Academy of Sciences, at a recent meeting, has elicited considerable attention from scientific men, who have received his views with a greater degree of credence than usually falls to the lot of novel suggestions—doubtless from their having emanated from so distinguished a source. The author denies that steel is a simple carburet of iron, which has been heretofore conceded to be its composition, and asserts that it is a nitro-carbide, being formed by a union of iron, nitrogen, and carbon. He has conducted many experiments, which satisfy him of the truth of his theory, and presents it to the scientific world, feeling assured that all intelligent observers will coincide with his views and arrive at the same conclusion.

M. FREMY seems to have made the composition of steel a study for some years, for some time ago he called attention to the fact that in effecting a solution of steel in acids, a residuum is left totally unlike pure carbon in its physical properties. On examination he was impressed with the fact that the reactions of this residuum indicated a strong resemblance to certain cyanides. Following up these suggestions, he commenced to experiment upon the mutual reactions of the three elements—carbon, nitrogen, and iron—and subjected the latter to contact with the others in a variety of experiments. By passing gaseous ammonia upon iron in a heated state, he obtained a compound of nitrogen and iron, with which he made further essays, all of which tended to confirm him in his impressions that nitrogen is a regular component of steel and necessary to its formation.

In investigating the combination of iron with carbon, M. FREMY used coal gas, which he passed in a stream upon the iron at a red heat. The product of this experiment was a gray metal, quite malleable, and similar to charcoal iron in many other particulars. By the successive use of ammoniacal gas and ordinary coal gas, steel of the best quality was produced; and by the repeated performance of this and similar experiments, the conclusion was irresistible that nitrogen largely enters into the composition of steel, and not only this, but the quality of the metal depends in a great measure upon the extent of the nitrogenizing which it may have undergone. In these experiments the steel was manufactured by the action of two gases upon iron, and this fact, if borne out by other trials, will doubtless create a revolution in the processes for the manufacture of steel upon the large scale; and if the views of the author of the new theory are confirmed by the experiments of others, we may soon hear of a new field for the employment of coal gas for other than illuminating purposes.

M. FREMY proves his theory that nitrogen is a component part of steel by stating the results of many experiments, in which a stream of pure hydrogen gas was passed upon heated steel, when large quantities of ammonia were disengaged. In these experiments he not only used steel which had been prepared by himself by the action of ammonia and coal gas upon iron, but also well-known commercial varieties of the prepared metal of English, French, and German manufacture, the results of which were precisely alike. Thus the conclusion seems natural that, as the generally accepted theory of the composition of steel has been declared to be erroneous by so eminent a *savan* as M. FREMY, changes will have to be made in the processes for its production; and as he has found coal gas to be an important medium of imparting the requisite quantity of carbon on a small scale, it may yet be employed in much more extensive operations for a similar purpose.

The managers of English collieries are discussing the feasibility of ridding themselves of the fire-damp which issues in such large quantities from the seams and crevices of coal-pits. As was mentioned on page 331 of this volume, fire-damp is collected and burned as an illuminator in several mines. Where the stream of gas issues regularly and in undiminished quantities it may be thus employed; but the principal danger to be apprehended from this compound is its sudden appearance in unlooked for places and when the miners are least prepared for it. When thus unexpectedly discovered, it takes the colliers unawares, and the dreadful explosions which have taken place in British mines, caused by the unexpected outburst of this gas, have been fatal beyond parallel. In view of the constant danger to which miners are exposed, a writer in the *London Mining Journal* suggests the propriety of purposely firing the gases at once as soon as they are met with, and of avoiding all hazard from this mode of procedure by erecting an "iron cage of which the sides shall be composed of wire gauze, one some distance behind the other, in which cage a flame is kept burning; the cage being connected by means of pipes or or other suitable channels with an upcast shaft, or any spot where the passage of burnt gases can do no harm, and where their progress is facilitated." It is said that by these means the large quantities of fire-damp can be effectually destroyed and rendered harmless to the collier, as, by being fired before a sufficient admixture of atmospheric air reaches it to make the gas explosive, it is divested of all of its dangerous properties. This, however, is but one of many suggestions which are constantly being made by practical men, with reference to disarming this noxious gas of its hurtful qualities. It is earnestly to be hoped that some of these plans will prove efficacious, and that if it is impossible to always control fire-damp and make it serve a useful purpose, it may be at least rendered incapable of inflicting those terrible injuries to which the miner is now exposed, and from which his sole protector is the Davy safety-lamp.

DRINKING FOUNTAINS IN TOWNS.—In England, particular attention is being paid to the erection of drinking fountains in towns and cities, and the local papers abound in accounts of their erection. These fountains are generally beautiful in their design, and thus combine the merits of usefulness and ornament.

SALE OF GAS-WORKS IN ENGLAND.—The Macclesfield, Eng., Gas Company have sold their works to the town corporation. It is stated that the price is £50,000, in bonds bearing 4½ per cent. interest, redeemable in five years. The transfer of the works is to be made on July 1st.

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No. 39 Nassau Street, cor. Liberty,
New York City.

INSPECTION OF GAS AND GAS-METERS IN BALTIMORE.—The proposed law for the inspection of gas and gas-meters in Baltimore, Md., of which we gave a synopsis on page 333, has been adopted by the councils of that city, and will go into operation at once. It gives us pleasure to announce that Prof. W. E. A. AIKIN of the University of Maryland, has been appointed inspector of the chemical quality and illuminating power of gas, for which he is well fitted by his enlarged experience and acknowledged scientific attainments. Prof. AIKEN is favorably known to the scientific world, and our readers will remember the able articles contributed by his pen to the columns of the JOURNAL, in the early period of its existence. We trust the Professor will again favor us with a record of any interesting facts which may present themselves to him in his official investigations.

MR. FREDERICK W. KING, the well-known maker of philosophical instruments of that city, has been appointed inspector of gas-meters under the provisions of this law, which we consider a very proper selection. The gas consumers of Baltimore may congratulate themselves upon the appointment of these gentlemen, and we are sure their interests are in competent hands, and will be well attended to.

ROCK OIL AS FUEL FOR STEAM-ENGINES.—A correspondent of the *Scientific American* says: An application of the rock oil of Pennsylvania for generating steam for motive power under steam-engine boilers is exciting much attention in the oil region. The following is a description of the apparatus used: A series of iron pipes are laid in the fire arch of the boiler, which pipes are perforated in their upper surface with minute holes; the oil is supplied to those pipes by means of a force pump, aided by an air receiver, to preserve a constant pressure. A spray, so to speak, of oil is thus made to fill the space usually filled by the flame of wood or coal used to rise steam; this, once ignited, fills the fire arch and flues of the boiler, and maintains the desirable amount of heat in the boiler.

If this fuel is not found to be too expensive, it will prove a good thing for the use of steamers on sea voyages. Its practical use has been proved, and it remains for chemists and others to test it on ships, &c., in a large way.

There can be but little doubt that this oil will be found cheaper than coal for gas-making for lighting dwellings, streets, &c.; its price, under the influence of the vast supply raised, will soon come down to a matter of fifteen or twenty cents per gallon.

ADOLPH BERGER, C. E.
BUFFALO, N. Y., April 9, 1861.

The invention of a suitable furnace for burning coal oil is a desideratum. This seems to be an inviting field for inventors.

VARIATION OF RAIN-FALL AT DIFFERENT ELEVATIONS.—A rain-gauge placed on the roof of a house, or in any elevated position, will show a great variation in the quantity of rain, from one placed in the ground. Thus the registered rain-fall, for one year, at the top of Westminster Abbey, London, was 12.099 in., while on the ground below it was 22.608 in.

CORRESPONDENCE.

An Editorial Coincidence.

To the Editor of the American Gas-Light Journal:

The following may escape your eye, and is therefore enclosed to you for such use and comment as you may think it merits. The subject on which it treats having interested me a good deal, was impressed upon my mind so forcibly as to enable me to turn at once to the quotations which are here side by side.

May 25th, 1861. O. T. O.

From the Scientific American.

[Notes and Queries. April 14, 1860. Page 254.]

"J. A. G., of Ohio.—There is no American work published on gas-lighting. Parnell's book on this subject was published several years since in London, and is a very good treatise. The subscription price of the 'London Journal of Gas-Lighting' is 18s. sterling per annum. It is published at No. 11, Bolt-Court, Fleet street, London."

From the American Gas-Light Journal, *Jan.* 1, 1861, *p.* 204.

The comparative merits of iron and clay retorts is a subject which has attracted much attention from the gas-engineering profession during the past few years.

* * * * * * *

The introduction of clay retorts seems to be due to Mr. Grafton, who, as early as the year 1820, took out a patent in England for their use. His retorts were at first square, but soon after were altered to the shape of a broad shallow ⏢, and were constructed in sections of about 16 inches in length, luted together with fire-clay. These retorts were 5 feet wide, 18 inches high, and 7 feet long, resembling an oven in their general contour. This shape was used for many years in some of the provincial establishments in Great Britain, and are perhaps still employed to some extent, although they have been generally replaced by the oval, circular, and particularly the common ⏢ shaped retort.

The gas-works of Scotland were among the first to appreciate the value of clay retorts, and their use is now almost universal in that country. They were there employed for a considerable period before their general introduction into England, where as their superiority became more widely known, they were gradually adopted, and now the proportion of iron and clay retorts in operation in the whole of Great Britain, greatly preponderates in favor of the latter.

* * * * * * *

The superior qualities claimed for clay retorts over those made of iron, are as follows: Their cost is less than iron; they are more durable; they have more carbonizing power; they produce a greater quantity and a better quality of gas. There are some parties who still advocate the use of iron retorts, and who of course will not admit these claims, but those who have adopted the clay retorts are firm in their belief that all of all the qualities above mentioned, are amply sustained.

* * * * * * *

At the South Metropolitan Works, in London, 17 months has been considered a fair duration for clay retorts, each one having produced 1,800,000 feet of gas, the expenditure of coal being no greater than that of iron retorts. Mr. Barlow, the editor of the *Journal of Gas-Lighting*, estimates 700,000 cubic feet of gas as the average yield of iron retorts. In the report of the chairman of the City of London Gas Company, January, 1859, the strongest testimony is adduced in favor of clay over iron retorts, and the reporter mentions as his honest belief that had not clay retorts been introduced, the gas companies would have been compelled to diminish their annual dividends, and some of them might even have been obliged to close their doors. Out of 468 clay retorts, in constant use by the above company, 196 had been in operation for over four years, and were all in the most efficient state for generating gas.

The partisans of iron retorts have contended that a much greater amount of fuel is required for carbonizing with clay retorts. It is true that the heat deemed most suitable for generating gas from them is several hundred degrees higher than that used with iron, but this intensity is efficient in producing a larger amount of gas than would be generated at the lower degree of heat required by iron retorts.

From the Scientific American, May 5, 1861, *p.* 334.

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Merits of Clay and of Iron Retorts.

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* * * * * * *

ANSWERS TO CORRESPONDENTS.

H. C. T., of N. H.—*Leslie's Argand burner is constructed on the principle of allowing a current of air to pass up between each of the jets of gas, so as to destroy, to a certain extent, the continuity of the flame. This action is effected by a number of small tubes, which rise to the height of about an inch above the ring which supports them. The tubes are made to converge slightly as they advance upwards, thus forming a truncated cone. The glass chimnies are constructed so as to deflect the air into the flame. The draft of this burner is too strong for common gas, as it overburns it, but for cannel or rosin gas it produces a brilliant light.*

L. E. I., of Conn.—*The exhauster may, by a too energetic action, draw a portion of atmospheric air into the pipes, which of course dilutes the rich gases and deteriorates their illuminating power.*

A. T., of N. Y.—*Of course, the result was what we predicted it would be. We formed our judgment according to the suggestions of well-known laws, and knew we could not be mistaken.*

Censor, of N. Y.—*You will have to try it again, as, when the operation is rightly attended, success is certain. We have had ocular demonstration of this; hence the positiveness with which we speak.*

A. D. O., of N. J.—*The Worthington water-meters are pronounced infallible, and we have yet to hear of a single complaint being made of their indications. They work to a charm, and we can unhesitatingly give them our hearty endorsement. You should by all means make a trial of their merits, and your company would largely profit by introducing them.*

E. W. S., of Pa.—*It was the Boghead coal, otherwise called Torbane Hill mineral, about which so much litigation was had and so many scientific tournaments were held, a few years ago, in England.*

Anthracite, of Pa.—*A large amount of "patent fuel" is made in England and some other parts of Europe from coal dust, cemented by some resinous or tarry substance. No doubt such a compound could be sold here, if made to combine the essential features—cheapness and cleanliness.*

O. W. H., of Pa.—*The bituminous coals from the Centre and Clearfield county region are of an excellent quality. They have not been tested as regards their gas-making qualities, nor, indeed, have they been yet largely sent to market. The beds are said to be inexhaustible, and the coal improves in quality the deeper the pits are sunk.*

E. H. C., of Ohio.—*Donovan's patent for making water-gas was taken out in* 1830.

L. K., of Ky.—*An instrument similar to the one you describe was introduced in England a few years ago, under the name of the "Steel Mill of the Miner." The light was generated by holding a piece of flint against the disc of a rapidly revolving steel wheel, and the stream of sparks ensuing afforded sufficient light to work by. It was thought that this apparatus would not generate sufficient heat to ignite fire-damp, but Dr. Pereira demonstrated before a Parliamentary committee that it was as dangerous as a candle, and consequently it soon went out of use.*

L. E. F., of Wis.—*We have no means of forming an opinion from the imperfect information you have sent us. You should state the matter more in detail*

A. V. R., of Iowa.—*We agree with you in every particular. Agitate the matter, and see what you can do at home before applying elsewhere.*

Gas Tar as a Paint.—Gas tar mixed with yellow ochre, makes a good green paint, very useful for preserving coarse wood-work.

REMARKS ON GAS FROM WATER, TURF, AND COAL.

BY G. HOWITZ,

Engineer and Manager to the Copenhagen Gas-Works.

We are indebted to Mr. Joseph Clayton, of London, for the following paper, which our readers will find of great interest:

About eight years since, a patent was taken out by Mr. Stephen White, of Manchester, for the manufacture of water gas, to which he gave illuminating power—first, by mixing it with gas from rosin, and, in his subsequent processes, by mixing it with gas from Boghead, and other cannel coal; the gas thus formed being called hydrocarbon gas. It was asserted, in favor of this process, that water-gas is not only an advantageous diluent of the rich gases of cannel coal, but that it possesses a peculiar solvent power, which diminishes the formation of tar, and thus increases the percentage of illuminating power in the hydrocarbon gas. The controversy which arose on that occasion did not, in my opinion, lead to any satisfactory result; therefore, I determined to make further experiments on the subject, with a view to ascertain, theoretically and practically, the cost of making 1000 cubic feet of water-gas, and also to determine the effect of steam, and other substances containing oxygen, on the non-oxygenous hydrocarbon coal-tar.

By Mr. White's process, water was admitted in drops into a diaphragm-retort, and the steam being decomposed by contact with glowing charcoal, the gases thus generated were passed over Boghead cannel during its distillation in the retort. Two Frenchmen, M. Gillard and M. Isoard, have since applied water-gas to illumination, but in different ways. M. Gillard commences by superheating the steam, and passes it in that state over glowing charcoal, thereby decomposing the largest possible portion of the water employed. The gas, after the removal of carbonic acid by lime, is applied in that state to heat, during its combustion, a net of platinum wire, the incandescence of which produces light. M. Isoard also superheats the steam before its decomposition, and then brings it into contact with the vapor of coal-tar, and thus produces an illuminating gas which may be burned in the usual manner.

My first experiments were made with water-gas, generated according to Mr. White's process. I employed an iron retort, with two mouthpieces and covers, and one ascension pipe. Charcoal was placed in the middle of the retort, and water was allowed to fall in drops at the end farthest from the ascension pipe. In order to determine the quantity of fuel required for the production of 1000 feet of water-gas with a furnace of the usual size, heating five retorts, a trial was made during several days by distilling, in the first instance, common Pelaw Main coal in the experimental retort, and the amounts of fuel used, and of coal-gas produced, were constantly noted. Afterwards, in experimenting with the water-gas, due correction was made on the above basis, and it was found that 140 lbs.* of coke were required for the production of 1000 feet of water-gas, composed as follows:

Hydrogen	64
Carbonic oxide	18
Carbonic acid	18
	100

The analysis was conducted in the usual manner, by first removing the carbonic acid with caustic potassa, then by the combustion of the remainder in a tube filled with oxide of copper; and the proportions of carbonic acid and hydrogen were deducted from the absorption of the carbonic acid and water. The proportion of hydrogen thus obtained, was rather too great; and it could not well be otherwise, for the iron of the retort must have absorbed a portion of the oxygen from the steam. The correct proportions should be—

Hydrogen	60
Carbonic oxide	20
Carbonic acid	20
	100

The quantity of water requisite for the production of 1000 cubic feet of gas of the above quality is 27.4

* The pound weight mentioned throughout this communication, is the Danish pound, which is somewhat less than the English; one Danish pound being equal to 0.91 English.

lbs. A much larger proportion of water was, however, used during the experiment—viz., 77 lbs.—from which it appears that a large volume of steam must have passed through the retort undecomposed. The composition of the gas, as corrected in the above figures, has been adopted in the following calculations, which are based on the theorems established by Mr. J. Thompson, lecturer at the Military College in Copenhagen.

The heat that gases evolve during their combustion may be taken to represent the proportion recovered from the heat employed to produce them. I can best express this by the term units of heat, which represent the number of pounds of water heated to one degree centigrade. According to Favre and Silberman—

Hydrogen has a heating power of		34,200	units.
Carbonic oxide, ditto	"	2,403	
Carbonic acid incombustible			
600 cubic ft. of hydrogen, weight 3 lbs. x		34,200—	102,600
200 " carbonic oxide, 14.15 x		2,403—	34,000
			136,600

The amount of heat required for the decomposition of steam, is found by taking the heating power of hydrogen, and subtracting therefrom the amount of heat that is required for the conversion of coal into carbonic oxide, and to carbonic acid in the retort. The conversion of coal to carbonic oxide requires (according to Grassi) 2480 units of heat for every pound of carbon, and its conversion into carbonic acid, 8000 units of heat fore very pound of carbon (Favre and Silberman). Six pounds of carbon being consumed for the production of each, there would consequently be required—

For carbonic oxide	14,880	units of heat.
For carbonic acid	48,000	"
Total	62,880	"

which, taken from 102,600, gives 39,720 units (*a*.)

The gas is first generated at a very high temperature (about the melting heat of copper), which may be assumed to be equal to 1000° centigrade; that is consequently the temperature at which the gas leaves the retort, and which it loses by cooling. This amount of heat expressed in units will be as follows:

3 (weight of hydrogen)x3.4046 (specific heat)x1000°—	10.213
14.15 (weight of carb. oxide)x0.2479 (specific heat)x1000°—	2.508
22.25 (weight of carb. oxide)x0.2164 (specific heat)x1000°—	4.815
(*b*)	18.536

There were, however, in addition to the 27.4 lbs. of water converted into gas, 49.6 lbs. which passed through the retorts without being decomposed, though it was converted into steam, and afterwards condensed. It is evident that it was not exposed to a sufficiently high temperature to decompose it, but the heat could not have been much less than 1000° centigrade. The quantity of heat thus applied and entirely lost would accordingly be as follows:

To evaporate 1 lb. of water into steam requires	637	units of heat.
To raise the temperature of the steam to 1000°, would require 900° (1000°—900°)x0.475 (the specific heat of steam)	428	"
	1065	"

Consequently, the number of units of heat required to convert 49.6 lbs. of water to steam of 1000° centigrade would be—

49.6x1065=52,824 units of heat (*c*).

If we now add together the whole amount of heat used, as theoretically determined, viz.:

(*a*) 39,720 units for the heating power of the gas;
(*b*) 18,536 units for loss by cooling the gas;
(*c*) 52,824 units for loss by condensation of undecomposed steam;

the total number of the units of heat is shown to be 111,080.

There were consumed in the furnace 140 lbs. of coke, to produce 1000 cubic feet of impure water-gas. Each pound of coke (of Pelaw Main coal) contained 25 per cent. of water, and 5.3 per cent. of ashes; the remaining 69.7 per cent. being carbon. The heating value of the coke used would consequently be 69.7 x 8000; and 1 lb. of coke should be equal to 5576 units of heat. The water in the coke must, however, diminish its heating value, as we must suppose the steam would be evaporated at a temperature of 1000° centigrade. It appears, therefore, from the preceding calculations, that the heat lost in burning each pound of coke that contains 25 per cent of water would be—

0.25x0637x0.25x0.475x900=266 units of heat;

so that the real heating value of 1 lb. of coke is—

5576—266=5310 units.

The next question to be considered is, how much of this heat is used in the decomposition of the water?

One pound of carbon requires 2.666 lbs. of oxygen for its combustion; therefore, the combustion of 1 lb. of coke will require 1.86 lbs. of oxygen. As only about one-half of the oxygen contained in the air is consumed in the furnace, 16.13 lbs. of atmospheric air will be required for the combustion of 1 lb. of coke. After the combustion it weighs 17 lbs., and its specific heat is about 0.24. In order to heat that quantity of air to 1000° cent., there will consequently be lost 1000°x0.24 x17=4080 units of heat; for the heat above 1000° is alone servicable. We thus get an efficient effect for every pound of coke of 5310—4080=1230 units of heat; and, as 140 lbs. are employed, the total effective heating power is 1230x140=172,200 units (*d*). The heat required for the production of 1000 feet of water-gas was stated to be 111,080, which, substracted from the foregoing, shows a difference of 61,120, due to waste of fuel, which amount, with coke, I have found exceeds one-sixth, say 20 per cent.=34,440; and 172,200—34,440=137,760; there being a loss of 20 per cent. unaccounted for.

Too much importance must not, however, be attached to these calculations, for there are some things which are not, and cannot be, so accurately determined as could be desired. For instance, the heat of the gas and of the steam may possibly be estimated too high; there is also a loss of heat by radiation from the furnace, which is not taken into consideration—but it can only constitute a small portion of the heating power of the fuel. It may, notwithstanding these possible errors, be confidently asserted that sufficient has been adduced for practical purposes to show what a large quantity of fuel is required for the manufacture of water-gas.

If we assume it to be possible to produce water-gas without the escape of any undecomposed steam, the effective heat required would be diminished by 52,824 units, or 51 lbs. of coke; and, in that case, 1000 cubic feet of foul water-gas might be generated with the consumption of 89 lbs. of coke; and the production of 1000 feet of the gas, freed from carbonic acid, would require 112 lbs.

(*To be concluded.*)

MASSACHUSETTS GAS-LIGHT ASSOCIATION.

The following circular has been addressed to the various companies in the New England States, inviting those disposed to do so to join the association and thus extend its sphere of information and usefulness.

OFFICE OF THE BOSTON, MASS. GAS-LIGHT CO.,
West street, Boston, May 9, 1861.

Dear Sir,—At an adjourned meeting of the Gas-Light Companies of this State, held in this city on the 4th inst., the enclosed Report and Articles of Agreement were unanimously accepted; and the Secretary was directed to transmit a copy to each of the organized gas-light Companies in the New England States, with a request that all the Companies which are disposed to do so shall send one or more delegates to the meeting for organizing the proposed association.

In accordance with this direction, notice is hereby given that a meeting for that purpose will be held at the office of the Boston Gas-Light Company, on Wednesday, July 17th, at 12 o'clock M.; and you are respectfully invited to send one or more delegates to the meeting.

If it should be the desire of your Company to join such an Association, will you have the kindness to signify that wish by a note addressed to the undersigned, at this office, on or before the 1st of July?

Very respectfully yours,

CHARLES C. SMITH, Sec'y.

To the President of the
..... Gas Light Co.

We are glad to perceive that the gas-light companies of Massachusetts have followed the example of those of this State, by forming an association for their improvement and protection. After a few more of the principal States do the same, a NATIONAL GAS-LIGHT ASSOCIATION should be formed, as recommended on page 56 of our first volume, composed of delegates from the various State associations.

REPORT.

The committee to whom was referred the question of forming an association of Gas-Light Companies, in submitting the articles herewith presented, report:

That the organization now proposed by them simply contemplates an association of the Coal Gas Companies of Massachusetts; but it is proper to say that in their opinion there are strong reasons for including *the whole of New England* in one Association, and they would recommend the merging of the present plan into a more general one when the companies in the other New England States shall signify their desire to join.

By order of the committee,

JOHN J. CLARKE, Chairman.

Boston, May 4, 1861.

CONSTITUTION.

Article I.—This Association shall be called the Massachusetts Gas-Light Association.

Article II.—The objects of the Association shall be to collect and diffuse information on all subjects connected with the manufacture, distribution, and consumption of Illuminating Coal Gas, and the relations of Gas-Light Companies to the consumers.

Article III.—Every duly organized company in the State of Massachusetts engaged in the manufacture of Illuminating Coal Gas, may become a member of this association by signing these articles on or before the third Wednesday of July, 1861, at which time the meeting for organization shall be held; and any such company may become a member after that date on the recommendation of the Executive Committee, by a vote of two-thirds of the members present at any regular meeting. Every company which shall be a member of the Association shall be represented by not more than three delegates, who shall be selected from the President, Directors, Treasurer, Agent, or Superintendent of such company, but only one delegate for each company shall be authorized to act at any meeting of the Association.

Article IV.—The officers of the Association shall consist of a President, two Vice-Presidents, a Secretary, and a Treasurer, who shall be an Executive Committee with full powers to carry out the objects of the Association, and to call special meetings whenever they deem it expedient. It shall be the duty of the President to preside at all meetings of the Association and of the Executive Committee; and in his absence the senior Vice-President shall act in his stead. It shall be the duty of the Secretary to keep the records of the Association and of the Executive Committee, to conduct all correspondence, and to notify all meetings. It shall be the duty of the Treasurer to assess, collect, and disburse the funds belonging to the Association, but no assessment or expenditure shall be made unless approved by the Executive Committee; and he shall keep a regular account of all receipts and disbursements, and make an annual report to the Association. The expenses of the Association shall be borne by the members in proportion to the amount of the capital stock of each paid in.

Article V.—The annual meeting for the choice of officers and for the transaction of such other business as may come before it, shall be held in the City of Boston, on the third Wednesday in January. Quarterly meetings shall be held on the third Wednesdays in April, July, and October, at such places as the Executive Committee shall appoint. Special meetings may be held at any time and place on the call of the Executive Committee, and shall be held at the written request of five members.

Article VI—The Association may pass such by-laws from time to time, as may be necessary for the proper carrying out of its objects and for the regulation of its business.

Article VII—This constitution may be amended at any regular meeting of the Association, by a vote of two-thirds of the members present; provided, that one month's notice of the proposed amendment shall have been communicated to all the members by the Secretary.

Article VIII.—Any member may withdraw from the Association on the payment of all assessments then due or levied; and every company which shall neglect

for the space of ninety days to pay any assessments shall thereupon cease to be a member. Any member may be expelled on the recommendation of the Executive Committee, by a vote of two-thirds of the members present at any regular meeting; provided, one month's notice of such recommendation shall have been communicated to all the members by the Secretary.

PETROLEUM, OR ROCK OIL.

We have reason to believe that the writer of this article is E. L. Corning, Esq., of the well-known firm of Corning, Bents & Co.

Rock Oil, or Petroleum, has existed for many years past among the low lands of Venango county, in the State of Pennsylvania, and was originally used by the Indians for medicinal purposes. Until within a comparatively recent period, however, no steps had been taken to explore the lands which showed unmistakeable "surface indications" of oil. In 1854, a gentleman of this city, having seen a sample of oil which had been taken from a spring near Titusville, in Venango county, determined to visit the locality and satisfy himself with regard to these curious phenomena. The result of his observations convinced him that oil could be found here in large quantities, and the lands only needed proper development to be rendered exceedingly valuable. He therefore, in company with some friends, bought up large tracts of land, and, after a time, commenced to bore for oil, which has hitherto been found in great abundance. Other parties soon heard of their success, and hastened to take advantage of this new road to wealth. The low lands bordering upon Oil Creek, which runs, commencing at Titusville, to the River Alleghany, were eagerly purchased by speculators, who, in some instances, held them but a few days, and then sold out at fabulous profits. Large tracts of "oil territory" near the towns of Titusville and Franklin were also bought, and are now in progress of development by parties who have taken leases of portions, just large enough to enable them to erect thereon the necessary buildings and vats. The lessees generally pay a bonus ranging from $50 to $400, and obligate themselves to erect the necessary buildings, furnish the requsite machinery, and sink the shaft without any expense to the owner of the land, who receives one-quarter to one-half of the oil, as may have been agreed upon. Some of these wells have been exceedingly profitable, producing thirty to sixty barrels (forty gallons each) of oil per diem, while others yield but two or three barrels. It is estimated by a competent authority that but one well in nine is successful, and the *average* yield of all the Venango county *working* wells is about five barrels per day. For want of any reliable statistics on the subject, it is impossible to give the number of working wells, but it is certain that there is not as much oil being produced as persons would naturally suppose. Many shafts are now being sunk in places where there is a good "show" of oil, but, on the other hand, there were not a few persons who offered the writer, on his recent trip to the oil country, all their right and title in oil lands and wells, for one-fourth of the original cost. Oil is obtained at various depths, from sixty to seven hundred feet—the latter, however, quite an exceptional case—but, as a general rule, on good lands, it is not necessary to bore more than 175 feet before striking a fine vein of oil. It is an exciting scene to see the workmen "strike ile," as they term it. The deep-seated, pent-up gas, oftentimes, forces the oil to the height of one hundred feet or more above the surface, and in several instances, where there was a fire near, the consequences have been highly disastrous. The stream, however, soon subsides, and then the copper tubing is introduced and the pump arranged. This is worked by a small steam-engine, which pumps up the oil into a vat or tank, whence it is drawn off into barrels, and is ready for shipment. Some wells produce almost pure oil, but these are rare. In the majority, considerable water is pumped up with the oil, the quality of which is in no way affected by it. Oil is classed by its specific gravity, the best quality ranging from thirty-six to forty. During the past winter, the excitement in the oil regions has been at fever heat, and pervaded all classes of people. Nothing else was thought of or talked about but "ile." The mania extended even to the church in Franklin, where the clergyman took for his text the words of Job—"And the rock poured me out rivers of oil."

The producers readily sold their oil at the well, at 20 *a* 23 cents, cash, per gallon; and some parcels brought even higher figures. This left a very handsome result on many investments, and encouraged new parties to undertake the production. As usual at this season of the year, the demand has fallen off, so that oil may now be purchased at considerably lower rates. This has discouraged the small producers, many of whom have sold out and returned home. The owners of some of the largest wells are confident, however, that there will be a market for all the oil produced during the coming season, and a number of them have stopped pumping, in preference to selling in the present dull state of the market. Besides the Oil Creek and Titusville oil wells, there are a number pumping, and in course of progress, on the banks of the River Alleghany, extending from the mouth of Oil Creek to a point four miles below the town of Franklin. Some wells have also been commenced on the islands in the river. Among the most remarkable, and, of course, not the least profitable, may be mentioned the "Hoover" well, situated on the Alleghany, three miles south of Franklin; the "Star well No. 1," on Oil Creek; also, the "Painter," and "Child and Watson" wells, at Titusville. The latter is known as the "Fountain well," so called from the oil being forced to the surface in a large stream, by the power of the gas alone. The oil passes into the vat by a tube, two inches in diameter, through which, at intervals of ten minutes, the gas forces it with tremendous power. The trouble and expense of machinery for pumping is thus obviated, and it is the only instance of the kind of which we have heard. The "Painter" well yielded, in six days, two hundred and forty-six barrels of pure oil, while the "Hoover" has produced sixty barrels of oil in 24 hours. In addition to these, there are a number of other wells almost equally remarkable, but we have not space to describe them. The oil when pumped from the well, is of a dark greenish hue, which by refining, is changed to a light yellow color. During the past season the refined article met with a ready sale, which encouraged the different companies in Pennsylvania, New York, and Boston, to make large purchases of the crude oil. Already several parcels of the Petroleum have been shipped to England, from which quarter it is anticipated that there will be, eventually, a good demand. Refineries and barrel factories are being established in the oil regions, where they now lack the proper facilities for getting the oil to market. By reason of low water the river communication between Franklin and Pittsburg is very irregular, but before many months, the Atlantic and Great Western Railroad Company expect to have their road opened to within twelve miles of the oil country, which will very much facilitate shipments. Great doubts have been expressed as to the permanency of the oil, but in regard to this, no conclusion can, of course, be formed, although the army of producers would justify the belief, that the oil could be pumped *ad infinitum*. At all events, the oil wells are curious and inexplicable phenomena, and the effect of their continued production is destined to be felt throughout the world.—*New York Price Current.*

LIGHTS IN THEATRES.—At a recent meeting of the French Academy of Sciences, the president sent in a paper on the foot-lights of theatres, and other matters relating to their construction. The competition opened by the government for the new opera house, was instanced as investing the subject with peculiar interest. The following statements were submitted.

1. That the foot-lights in their present position are extremely hurtful both to the eyes and voices of the actors, especially in the case of singers.

2. That the communications existing between the stage and the lower story by means of trap-doors, cause drafts of cold air which are highly prejudical to the actors.

3. That it would be highly advantageous both to the actors and to the public, if the foot-lights were replaced by a system of illumination from above, invisible to the public, and exercising no noxious influence over the performance.

FOREIGN NEWS.

LATE ENGLISH PATENTS.

A patent has lately been applied for in England by Maurice Wesolowski, of Cincinnati, Ohio, for "*Improvements in the obtaining of light, and in the apparatus employed therein.*" The object of this invention is to obtain an instantaneous light, suitable for lighting tapers or lamps, without the aid of matches, and consists in the employment of a small frictional electric machine, the disc or cylinder of which may be composed of glass, hard India-rubber, or other material, but hard rubber is preferred. The frictional rubber or pad is composed of cloth, or other suitable material, being supplied with a suitable amalgam. The rubber or pad may be applied to both sides of the disc when desirable. The amalgam is composed of one part by weight, of spelter or zinc, one part of tin, and one-half part of mercury. The spelter is first melted, the tin added and well mixed with it, after which the mercury is thoroughly mingled with the mass. It is then poured on an iron plate, where it is cooled, and subsequently reduced to powder in a mortar, and passed through a fine sieve. The current of electricity generated by the machine is conducted to a vessel containing a mixture of "sulphuric alcohol and etheric oil" or other equally inflammable fluid, this vessel being insulated. A cotton or other wick in this liquid is, in connection with a wooden or other suitable electrode, carried by the cover of the vessel. Above the end of the electrode is a metal wire, or negative, for the purpose of obtaining the electric spark when the machine is operated.

In using this apparatus for the obtainment of an instantaneous light, it is simply necessary to impart a sharp turn to the disc or cylinder of the electric machine, whereby the current generated is conducted by a suitable conductor through the metal of the vessel, and is discharged from the metal socket which contains the electrode. This electrode being saturated with "alcoholic sulphur and etheric spirit" is instantly ignited by the action of the electric spark and remains ignited as long as required for obtaining a light for a taper or light.

A patent has been granted to William Mann, of Barnsbury, London, gas-engineer, for "*Improvements in apparatuses for washing and condensing gas.*" These improvements consist in the employment of a syphon tube, the lower part of which enters the vessel in which the washing is performed, known as a scrubber; the tube is then bent and is turned at the extreme end. Through a box, in the centre of the cover of the scrubbing vessel, is introduced a shaft, with a tray or grating connected to and so as to revolve with it. The tray is charged brick, pebbles, coke, or other like suitable material. A pulley is placed on the shaft, and fitted on the lower part of the syphon tube is a rigger. A belt passed around the pulley and rigger imparts a rotary motion from the shaft to the tube. The top of the syphon tube is furnished with a funnel, into which a continuous supply of water or other washing liquid, is fed from a cistern or other source. Under the grating or tray, a supply of pebbles, coke, or other like material usually employed in scrubbers, and through which the gas is made to rise, is placed.

The improvements in apparatus for condensing gas, consists in surrounding the condensing pipes ordinarily used in gas-works, with a series of brushes or rubbers of cotton, or other like material, which are made to rise and fall up and down the pipes, between trays or troughs fixed at intervals on the pipes, and supplied with water which is fed into the uppermost trough, the overflow from which enters the next below it, and so on. In cases where the condenser pipes are horizontal instead of vertical, the brushes or rubbers are made to revolve round the pipes, and are supplied with water from a trough underneath.

The patentee does not limit himself to the particular arrangements hereinbefore described; as, for example, in the apparatus for washing gas, two revolving tubes may be employed, each receiving a continuous supply of water, and both receiving motion from the central shaft; and it is not necessary that the arm of the syphon tube should receive a rotary motion, as a vibratory one will answer, the only difference being that the liquid will be led in semi-circles instead of circles.

The claims are for—

1st. The arrangement of apparatus for washing gas hereinbefore described, whereby continuous streams or showers of water, or other cleansing liquid, are maintained in the cleansing vessel or scrubber.

2d. The improvements in apparatus for condensing gas, whereby the outer surfaces are moistened substantially in the manner hereinbefore described.

PATENTS.

UNITED STATES.

1,157.—E. B. Coffin, (assignor to himself and A. H. Sylvester), of Johnston, R. I., for an Improvement in Lanterns:

I claim, in connection with the cylinder, G, coal-oil burner, E, and chimney, F, the valves, J, in the dome or chamber, I, the deflector or plate, H, in the cylinder, G, and the register, C, at the base of the lantern, when all are combined and arranged substantially as and for the purpose specified.

[The object of this invention is to obtain a lantern for burning kerosene or coal-oil. The invention consists in the use of two air chambers applied to the lantern, and used in connection with an ordinary coal-oil burner and glass chimney.]

1,187.—H. H. Hudson and G. W. Billings, of Cleveland, Ohio, for an Improvement in Water Elevators:

We claim, first, The dividing share, E, either with or without friction rollers at the ends, for separating the coil of rope upon the pulley, D, as specified.

Second, We claim the arms, F, with the guard, S', as shown, for the purpose of presenting the bucket in a right position to the spout, and causing its lateral movement towards the spout, in connection with a movable or stationary bail or tipper, L, operating in the manner and for the purpose set forth.

1,188.—B. B. Kenyon and I. S. Brown, of Hopkinton, R. I., for an Improvement in Water Wheels:

We claim increasing the diameter of the wheel and the width of the buckets, D, immediately below the casing or curb, K E, in combination with the exterior rim or cylinder, M, substantially as and for the purposes set forth.

1,192.—Harvey Locke, of South Boston, Mass., for an Improvement in Pumps:

I claim, first, The annular valve, H, so constructed as to disclose when opened a water way around the whole circumference of the cylinder, as described.

Second, I claim the disk valve, G, covering the whole end of the cylinder, as described, for the purpose set forth.

Third, And in combination with the valve, G, I claim the disk of india-rubber or leather confined to the piston, as set forth and operating as described.

Fourth, So connecting the inlet and outlet valves together that the motion of one of them shall control the motion of the other, as set forth.

1,197.—John Neumann, of New York City, for an Improvement in Faucets:

I claim the chamber, B, on faucet tube, A, having arranged within it the valve, c, and the screw stem, D, with its enlargement, g, all arranged and operating substantially as and for the purposes set forth.

[This invention relates to a new and useful improvement in faucets, intended especially for beer barrels where the barrels are kept in the cellar and the beer pumped up by a pump in the store whenever it is wanted.]

1,198.—George Norris, of New York City, for an Improvement in Filters:

I claim the combination of the perforated compression and discharge screw or tube, E, and plate, C, with the filtering material, B, and case, A, in the manner and for the purposes, substantially as described.

[The object of this invention is to obtain a filter of very simple construction, which may be so adjusted as to allow the water to escape, though it is in an unfiltered state, when filtered water is not required, as, for instance, for washing purposes.]

1,215.—John McAuley Gallacher, of Roxbury, Mass., for an Improvement in the Construction of Gas Retorts:

I claim the construction of the retort with longitudinal ribs and projecting lugs, as shown and described.

[This invention consists in the arrangement of lugs, projecting from the outside surface of the retort and forming the supports of longitudinal ribs, for the purpose of holding the cement which is placed on the outside of the retorts to preserve them against the injurious effects of the fire.]

1,218.—W. H. Gwynne, of New York City, for an Improvement in Apparatus for Naphthalizing Gas:

I claim, first, The use of a reservoir for containing a liquid hydro-carbon attached to the gas fixture, and provided with a pipe communicating directly with the burner, substantially as shown and described. and for the purpose explained.

Second, The arrangement of the revolving pipe, B, and reservoir, A, in combination with a gas-burner, substantially as and for the purpose described.

1,233.—S. W. Warren, of Brooklyn, N. Y., assignor to himself, T. C. Banks and John Thompson, of New York City, for an Improved High and Low Water Indicator for Steam Boilers:

I claim, first, The syphon pipe, e, in combination with the expansion pipe, B, arranged in the manner and for the purposes set forth.

Second, I claim introducing the pipe, d, into the steam boiler at the level of the greatest hight to which the water is to be supplied so as to produce a high water indicator by the circulation of hot water through the expansion pipe, B, for the purposes set forth.

Third, I claim the arrangement of the glass indicating gage, f, and valves or cocks, n n, in combination with the pipes, d and B, for the purposes set forth.

1,244.—Frederick Heidrick, of Philadelphia, Pa., for an Improvement in Lamps:

I claim so arranging said sheaths that the outside one will come up even with the top of the wick tube, and the top of the second a little below that of the first, in the manner and for the purpose specified.

1,247.—J. M. May, of Janesville, Wis., for an Improvement in Pumps:

I claim, first, A piston made with one or more grooves or holes in the side thereof, in combination with a sliding ring to open and close alternately induction grooves or holes as the pump is operated, and a cylinder without induction aperture in its bottom, when a piston, a ring and a cylinder are constructed and arranged relatively to each other substantially as and for the purpose described.

Second, A set screw or pin passing through the side of a cylinder, with its point extending into, and fitting easily a longitudinal groove or channel in a piston, when used to connect a cylinder and piston, and regulate the stroke of a pump, substantially as described.

Third, A toggle joint, or its equivalent, in combination with a rod or base, M, cylinder, A, piston, B, and eduction pipe, I, when constructed substantially as and for the purpose described.

1,256.—W. E. Watters, of East Bend, Ky., for an Improvement in Pumps:

I claim, first, A double-acting pump, its cylinder having no other opening to its interior than that through which the tubular piston rod works, and having no valves other than those contained within the piston itself.

Second, The induction pipe, inclosing the discharge pipe, both being attached to the piston (or a part thereof) and together serving the purpose of the piston rod, substantially as described.

Third, The double-acting ring valve, n, for alternately closing the passages, k, and the apertures in the cap, m, in combination with the induction pipe, substantially as described.

Fourth, Forming the induction valves by the pieces, h and m, closing respectively against the internal flange of the piece, f, and the disk, g, substantially as described.

Fifth, The several parts composing the piston and its valves, viz.: the external ring, f, the perforated disk, g, the piece, h, with its spaces and passages, and its connection with the suction and discharge pipes, and the flat double-acting valve ring, n, in combination, for the purposes and substantially as described.

1,286.—C. C. Hoff, of Poughkeepsie, N. Y., for Mastic Composition for Roofing:

I claim the described composition of gas tar, treated and prepared in the manner specified, black oxyd of manganese, boiled plaster of Paris, alum, and calcined charcoal, mixed together in the manner and about in the proportion stated, and applied to the canvas, substantially as and for the purpose set forth.

1,294.—Henry Knight, of Jersey City, N. J., for an Improvement in the Manufacture of Hydraulic Cement Pipes:

I claim, first, Manufacturing cement pipes with metallic pipe intermediate between its inner and outer surfaces, by arranging the metallic pipe over the core, B, and within the mold, F, so that it divides about equally the space between the core and the mold, and then placing an annular centering device, I, between the pipe and the mold, and introducing the cement first between the metallic pipe and the core, and then between the pipe and the mold, all substantially in the manner and for the purpose described.

Second, Finishing the sections of the combination pipes at one of their ends with a metallic coupling extension, J, by means and in the manner substantially as described.

1,301.—W. H. Miller, of Philadelphia, Pa., for an Improved Low Water Alarm for Steam Boilers:

I claim the metal tube, L, and the float valve, M, working within the glass tube, G, in the manner and for the purpose specified above and for no other purpose.

1,308.—Thomas Powers, of Philadelphia, Pa., for an Improvement in Gas Regulators;

I claim the combination and arrangement of the double-acting ball valve, A, with the hollow sliding tube, L, and the perforated hemispherical disk, K, operating substantially as set forth.

1,325.—J. E. Wootten, of Philadelphia, Pa., for an Improved Hydrostatic Pressure Indicator:

I claim the ram, G, the cylindrical opening, x, in the block, E, and the permanent, self-tightening packing, h, when the said block is of an appropriate shape for forming a communication between the said opening, x, and the space beneath the ram of an hydrostatic press, and when the whole is combined with an elliptical or other suitable spring, the pointer, Q, graduated index plate, D, and the devices described, or their equivalents, for transmitting the motion of the spring to the pointer, substantially in the manner and for the purpose set forth.

MANGANESE DISINFECTOR.—Chemistry is essentially a science of progress and utility. Every experiment made in a laboratory has utility for its object, or a truth to confirm. Latterly, sanitary matters have been much discussed; and as the human family have a tendency to congregate together into large bodies, it is well that the chemist's thoughts should be directed toward the best means of utilizing the sewerage of populous places. It is a noble calling to cure diseases, but to prevent them is nobler still; and we cannot hold in too high esteem those men who, by their inventions, save us from plague and pestilence. Scheele, the discoverer of chlorine, was the first man who gave to his fellow-creatures a real preventive of contagion. To him all honor is due. Several combinations of chlorine, under the title of chloride of zinc, chloride of lime, have been very usefully applied as disinfectants; of course, improvements have taken place in these things since Scheele's time; and that which we have more particularly to notice now is Condy's manganese disinfector, which possesses all the good qualities attributed to chlorine compounds, and, in many respects, is far superior to them. Unfortunately, a great number of accidents—even deaths—have occurred from the chloride disinfectors now in use; it would, therefore, be better for society if the manganese disinfectant were generally introduced, which is said to be free from any possibility of mistake, being perfectly innoxious, and an excellent disinfecting and deodorizing agent.—*Septimus Piesse.*

Things Ancient, Quaint and Rare.

PURITAN WARRANT FOR VIOLATION OF THE SUNDAY LAW.

SUFFOLK, ff.—To the Sheriff of the County of Suffolk, his Under-Sheriff or Deputy, or to any of the Conſtableſ of the Town of Boſton, greeting:

Whereaſ, The Grand Inqueſt for the Body of the County of Suffolk have, upon their oaths, presented that Gamaliel Rogerſ, of Boſton, in the County of Suffolk, Victualler, hath wilfully abſented himself from the publick worſhip of God for the ſpace of five weeks laſt paſt, not having at such time any lawful cauſe for so doing, contrary to law.

2. That Benjamin Loveage, of sd. Boſton, Labourer, hath abſented himſelf from the publick worſhip of God, for five weekſ laſt paſt, contrary to law, &c.

3. That Hannah, the wife of Edward Sadler, of said Boſton, Ropemaker, hath wilfully abſented herſelf from the publick worſhip of God for ſix weekſ laſt paſt, contrary to law, &c.

These are therefore in Hiſ Majesty's Name to Will and Require you to Attach the Bodys of the ſaid Gamaliel Rogerſ, Benjamin Loveage & Hannah Sadler, if they may be found in your Precinct, and them carry before one or more of His Majeſty's Juſtices of the Peace in ſaid County of Suffolk, in order to their being ſecured, to make answer to ſaid Presentments at the Adjournment of Court of General Seſſionſ to be Holden at Boston in and for ſaid County of Suffolk, on Monday, the twenty-eighth day of January inst., at nine of the clock in the forenoon of sd. day.

You are alſo alike required to ſummon the Perſons named as Witneſſeſ to the reſpective Presentments to appear at the ſame Time, to give evidence on Hiſ Majesty's behalf. Hereof fail not, and make Return of your Doings therein unto the ſaid Court.

Dated at Boſton the eleventh day of January, in the Seventh year of Hiſ Majesty's Reign, Annoque Domini, 1733.

By order of Court Atty.

BYFIELD LYDE, Clerk.

SUFFOLK, ff.—Boſton, Janur. 28, 1733.—I have attached the Bodys of the within named Perſones, and have them. Bease Juthes Coſte.

SAM. GRAFTON, Depty Sheriff.

ANNOUNCEMENT OF THE DEATH OF OLIVER CROMWELL,

From the Commonwealth Mercury.

Whitehal, Sept. 3, 1658.

His Moſt Serene and Renowned Highneſs OLIVER Lord Protector, being after a ſickneſs of about fourteen days (which appeared an Ague in the beginning) reduced to a very low condition of Body, began early this morning to draw near the gate of death; and it pleaſed God about three a clock afternoon, to put a period to his life. I would willingly expreſs upon this ſad occasion, the deep ſorrow which hath poſſeſſed the mindes of his moſt Noble Son and Succeſſor, and other deareſt Relations, had I language ſufficient: But all that I can uſe, will fall ſhort of the merits of that moſt excellent Prince. His firſt undertakings for the Public Intereſt, his working things all along, as it were out of the Rock, his founding a Military Diſcipline in theſe Nations, ſuch as is not to be found in any example of preceding times; and whereby the Noble Soldiery of theſe Nations may (without flattery) be commended for Piety, Moderation, and Obedience, as a pattern to be imitated, but hardly to be equalled by ſucceeding generations: His Wiſdom and Piety in things divine, his Prudence in management of the Civil Affairs, and conduct of the Military, and admirable Succeſſes in all, made him a Prince indeed among the people of God; by whoſe prayers being lifted up to the ſupreme Dignity, he became more highly ſeated in their hearts, becauſe in all his actings it was evident, that the main deſign was to make his own intereſt one and the ſame with theirs, that it might be ſubſerving to the great interest of Jeſus Chriſt.

GAS-EXPLOSION.—On the evening of May 28th, a gas explosion occurred in a new building in Third Avenue, between 54th and 55th streets, in this city. Four men entered a room in the house to repair a leakage in one of the gas-pipes, and although warned not to take a light, they disregarded the precaution, and immediately upon opening the door, the escaped gas ignited with a loud explosion, seriously injuring the sidewalls and shaking the whole building. The four men were each badly burned—two of them dangerously so. The police soon extinguished the flames, and physicians being called in, the sufferers received prompt attention.

BITUMINIZED GAS AND WATER PIPE.—This description of gas and water pipe, made from bituminized paper, is said to be quite as durable as iron, at about half the cost. It is quite extensively manufactured in England, but has not been introduced into this country.

FATAL ACCIDENT CAUSED BY BURNING FLUID.—On May 28th a girl, seventeen years of age, died at the New York Hospital, from burns received in the explosion of a can of burning fluid. Her brother had spilled some of the fluid, and while wiping it up with a cloth, set the can near the stove. He then threw the saturated cloth into the stove, which immediately took fire, and the flames communicated to the can, which exploded and fatally burned the deceased.

ACTION OF HARD WATER UPON LEAD.—It has been generally supposed that hard water had little or no action upon lead pipes, and that more danger was to be apprehended from the contact of nearly pure, or soft water with lead. A writer in the *New Philosophical Journal*, who has made numerous experiments to arrive at the truth of the question, asserts that certain pure and soft waters do not act upon lead, and that some impure or hard waters do act upon lead.

FATAL SEWER ACCIDENT.—A sewer excavation in, South Third street, near Ninth street, Brooklyn, N. Y., caved in on the 23d ult., instantly killing one man and slightly injuring three others. The name of the man killed was Hugh O'Rourke. The accident was purely the result of carelessness. The earth in the excavation being improperly braced, caved in, striking O'Rourke, and killing him almost instantly. Coroner Murphy held an inquest upon the body, and a verdict in accordance with the foregoing facts was rendered. This is the second accident of this nature which has occurred in Brooklyn within a week. There is a fearful responsibility somewhere.

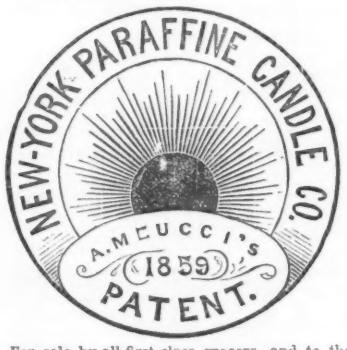
POWER OF FALLING WATER.—Twelve cubic feet of water per second, falling one foot, will, in its best application to a water-wheel, give out one horse power, the actual weight, falling through one foot, being nearly 45,000 lbs. per minute.

COAL-OIL & CANDLES.

CANDLES FROM COAL.—Manufactured by the New York Paraffine Candle Co. Under Meucci's Patent. The above Company having recently made great improvement in their mode of manufacture, now offer to the public a Candle superior to any other in the market. They give a softer and more brilliant light, and burn 6 hours to the pound longer than the best wax and sperm, and, considering the strength of the light, are the most economical Candles in use.

CAUTION.

As unscrupulous persons are already offering imitations of these Candles, purchasers should bear in mind, that every box sold by this Company is stamped with the annexed trade mark, to counterfeit which is felony.



For sale by all first-class grocers, and to the trade by WM. E. RIDER,
General Agent of the Company,
16 Beekman Street, New York.

STANDARD PHOTOMETRIC Candles.—Owing to a number of Applications made to me for information concerning the supply of the "Standard Sperm Canles," used in Photometrics, I have obtained a supply, from which I can furnish those who require them with full directions for use.
T. W. PARMELE,
No. 4 Irving Place, New York.

TO CANDLE AND SOAP Makers.—Processes with drawings to manufacture every kind of candles and soaps by different processes: Candles by distillation, saponification, French candles, common candles, hard and soft soaps, palm soaps; processes to bleach palm oil and make candles out of it; purification of tallow; essays on greases and soaps. Address, Professor H. DUSSAUCE, Chemist, New Lebanon, N. Y.

J. L. McREA, Dealer in Coal Oils and Lamps, Binnacle and Signal Light Oils, 139 Water street, New York.

THE LUTHER ATWOOD OIL CO.—Manufacturers of Superior Illuminating, Machinery and Binnacle Oils, Office, No. 34 Burling Slip, New York.

EMPIRE CITY CAMPHENE Works.—Aaron Seeley, Manufacturer and Distiller of Camphene, Alcohol, Burning fluid, Coal-oil, and dealer in Naval Stores of every description. 32 and 34 Burling Slip, New York.

H. RIDER & CO., New Bedford, Mass.—Purchasers and Manufacturers of Semi-Crude Paraffine. Ryder's Patent Paraffine Candles, manufactured and for sale.

NEW BEDFORD OIL CO.—Office foot of South-st., New Bedford, Manufacture Coal-Oil for Illuminating and Lubricating purposes, of the best quality.
ABRAHAM H. HOWLAND.
Our Coal-Oil will burn in all Kerosene Lamps.

C. R. WOODWORTH, Manufacturer of
PORTABLE GAS WORKS,
74 WALL STREET, NEW YORK CITY.

PORTABLE GAS-WORKS.

BUTLER'S PATENT PORTABLE ROSIN GAS WORKS,
FOR
Dwellings, Churches, Country Villages,
As well as for Consumers in Large Cities.
JOHN BUTLER,
No. 112 Fulton st. and 15 Henry st., Brooklyn, N. Y.

FOR LIGHTING RAILROAD CARS AND STEAMBOATS WITH GAS.
The whole process of Filling the Gas-Holders of a Railway Train, requires but Three Minutes.
Apply to the
NEW YORK CAR & STEAMBOAT GAS. CO.,
No. 117 Fulton st., N. Y.

PORTABLE GAS WORKS.—S. T. McDOUGALL'S PATENT Portable Gas Works, for making Gas from Rosin, Rosin Oil, Coal Oil, Naptha, Grease, etc. These Works combine the latest improvements in gas making, and are guaranteed to be superior to any in market. They are made of all sizes, suitable for either country or city use. No county house is complete without its Gas-Works. Gas Stoves of every description on hand and made to order. For sale by S. T. McDougall, 170 Center St., New York.
Agents wanted in other cities to sell rights or machines.

GAS FOR THE COUNTRY.—C. WOOSTER, Manufacturer of Improved Portable Gas-Machines, for Villages, Public Institutions, Churches, Hotels, Railroad Depots, Factories, Mills, Machine-Shops, Plantation Dwellings, &c. Office, 256 Canal street, near Broadway.
This Machine has been in successful operation for years, in many of the best residences and factories in the country; and for simplicity of construction, ease of management and economy of light produced, possess advantages over all other machines for the purpose now in use. It is adapted to the making of Gas from Crude Rosin or Rosin-Oil, producing a Gas of twice the illuminating power of Coal-Gas, at about one-half the price usually charged for that gas.
Every Machine is sold under a strict guarantee to operate according to representation, and no payment required until the fact is demonstrated by actual use.
For further particulars, and descriptive pamplet containing references to numerous parties now using the apparatus, address
C. WOOSTER,
No. 256 Canal st., near Broadway, N. Y.
For Engravings, see AMERICAN GAS-LIGHT JOURNAL, for June, 1860, page 245.
☞ Responsible Agents wanted, with whom liberal arrangemets will be made.

APPLETON'S IMPROVED GAS-Works, for Factories, Hotels, Dwellings and Towns. The most simple and economical works in use, furnishing a superior light to coal-gas at a cost of one-half a cent per burner per hour. It does not injure trees, or plate, and is not affected by cold. For Circular and Terms, apply to APPLETON & GRAHAM,
56 Washington street, Boston.
For Engravings, see AMERICAN GAS-LIGHT JOURNAL for April, 1860, page 213.

MARSH'S PATENT ROSIN OR Sun-Light Gas-Works, for Private Dwellings, Hotels, Factories, Railway stations, Sugar-houses, Towns, &c. By the peculiar construction of the Retorts, the largest amount of decomposing surface is obtained in the smallest space. 2d. Gas is manufactured from crude rosin, without the least deposit of carbonaceous matter in the retorts or pipes: thus enabling them to be operated continuously, generating rapidly the best and cheapest illuminating gas obtained from this material. ALFRED MARSH & CO.
241 Broadway, New York.

MARYLAND GAS COMPANY are constantly constructing their superior Patent
PORTABLE GAS-WORKS,
of any capacity, from that required for Private Dwellings, Public Buildings, &c., to such as will supply Cities and Towns, complete in all their parts, for the manufacture of Gas from either Rosin, Oil, Coal, or Rosin.
P. S.—This Company also manufacture a superior article of ROSIN-OIL, especially for Gas purposes. Their experience for the last nine years has secured for them a perfect success of their Gas-Works. Address
Maryland Gas Company, Baltimore, Md.

GAS AND WATER-PIPE.

W. & J. GRIFFITHS & CO.—City Tube Works, Malleable Iron and Brass Foundry, No. 27 North Seventh street, Philadelphia. Manufacturers of Wrought Iron Pipe, Lap-Welded Flues and Fittings; also, Brass Work of all descriptions, for Gas, Steam and Water. Particular attention given to Heating Buildings, &c.

PARIS'S PATENT
Glass-Enamelled Wrought Iron Tubes,
PROSSER'S PATENT
LAP-WELDED IRON BOILER TUBES.
TUBES FOR ARTESIAN WELLS, CONVEYING STEAM OR WATER, SHAFTING, &c., SCREWED OR COUPLED TOGETHER, in various ways.
THOS. PROSSER & SON, 28 Platt st., N.Y.

CAST AND WROUGHT IRON Pipe, Branches, Elbows, Sleeves, &c. Lamp-Posts, Wrought-Iron Lanterns for Lamp-Posts, Gas Retorts (clay or iron), Street Mains in 9 or 12 feet lengths. Sheet-Iron cut to pattern for Gas-holders. For sale by the Manufacturers' Agent,
HENRY G. NICHOLS, 24 Pine st., N. Y.

HUNTER, KELLER & CO., Manufacturers of
WROUGHT-IRON PIPES & FIXTURES,
of all descriptions, for
STEAM, WATER AND GAS.
144 Centre street, New York.

GIRARD TUBE WORKS—MURPHY & ALLISON, Proprietors. Wrought Iron Coke-Welded Tubes, for Gas, Water, Steam, &c. Wrought, Cast and Malleable Iron Fittings, Steam and Gas Cocks, Valves. Also, Galvanized Tubes and Fittings.
Office 1908 Market street, Philadelphia.

AMERICAN TUBE WORKS.—W. G. Smith & Co., Forty-sixth street, East of 10th Avenue, New York City. Manufacturers of WELDED IRON PIPE for Steam or Gas, of all sizes, from 1-8th to 3 inches.

JOSEPH NASON & CO., 61 BEEKMAN STREET, corner of Gold Street, New-York, Manufacturers of Wrought and Cast-Iron Pipes, and every description of Steam and Gas-Fittings used by Engineers, Manufacturers, and Gas-Fitters.

Boiler Flues,	Back Pressure Valves,
Steam Boilers,	Steam Traps,
Boiler Pumps,	Steam Whistles,
Steam Pumps,	Gauge Cocks,
Steam Gauges,	Gas Cocks,
Safety Valves,	Gas Meters,
Stop Valves,	Fitters' Tools,
Check Valves,	Proving Pumps,
Governor Valves,	Screwing Machines.

JOSEPH NASON,
HENRY R. WORTHINGTON.

MISCELLANEOUS.

[OFFICIAL.]

OFFICE WILLIAMSBURGH GAS-Light Company, Brooklyn, N. Y., May 16, 1861.—The annual election of seven Directors of this Company, and of three Inspectors of the next succeeding election, will be held at the Office of the Company, Fourth street, corner of South Third street, on Monday, the 3d day of June next. The polls will be opened at 5 o'clock P. M., and closed at 6 o'clock P. M. The Transfer Books will be closed from May 29th to June 3d, inclusive. By order
C. F. BLODGET, Secretary.

MESSRS. J. WRIGHT & CO., CONSULTING ENGINEERS and SOLICITORS of PATENTS, No. 42 Bridge street, Blackfriars, London, E. C. Patents for inventions obtained in all countries where Patent Laws are in force.

HOT WATER GAS STOVES, Manufactured by HUNTER, KELLER & Co., 144 Centre street, New York.
See Engravings on page 163, Vol. II. of this JOURNAL.

GAS-BURNERS.

T. G. ARNOLD, Manufacturer of Gas Burners, Mercury Cups, Portable Sockets, Burner Pillars, &c., No. 447 Broome street (second door west of Broadway), New York. Imported Scotch Tips and Burner Plyers always on hand.

ORNE'S PATENT FILTER-REGULATING GAS-BURNER, admitted by all practical and scientific men, who have examined its movements, to be
THE BEST GAS-BURNER YET INVENTED.
They are self-regulating, gas-purifying, indestructible, and most economical.
For sale by S. A. STETSON & CO.,
350 Washington st., Boston.

PERFECTION.—This recent Improvement in Gas-Burners embraces the great economy of the Hicks Patent Burner, a gain of over 75 per cent. in light. This Burner is now offered to the Trade and all consumers of gas, at the price of the common burner. It is anti-corrosive, gives a uniform and beautifully-shaped blaze, under any pressure, and will not get out of order.
It has been adopted by the Manhattan and Brooklyn, N. Y., Gas-Light Cos., for street lamps.
Samples will be sent to each Gas Co. in the United States, if requested.
Address, L. E. HICKS, 335 Broadway, New York.

HEATING APPARATUS.

JOSEPH NASON & CO., Constructors of Apparatus for Warming Public and Private Buildings by Steam and Hot Water.
Improved Fans for Ventilating Hospitals and other Public Buildings.
JOSEPH NASON,
HENRY R. WORTHINGTON,
No. 61 Beekman street, corner of Gold street, New York.

STEAM DOMESTICATED.—LOW Pressure Steam for Domestic Warming, an apparatus which is simple, durable, economical, and perfectly safe. Estimates given and work done in any part of the country.
Descriptive pamphlets furnished on application to BAKER, SMITH & CO.,
Sole manufacturers, Nos. 180 and 182 Centre street, N. Y.

GEORGE L. CANNON, Successor to the Rippowam Co., 54 East 13th street, between Broadway and University Place, manufacturer and dealer in Air, Water and Steam Warming and Ventilating Apparatus, Cooking Ranges, Range Furniture, Registers, Ventilators, &c.
Particular attention given to Heating Churches, School-Houses, Public Buildings, &c.

GASOMETER RIVETS.

PHILLIPS & ALLEN, Pennsylvania Avenue, above 22d street, Philadelphia.—GASOMETER RIVETS of all kinds.

GAS-METER FLUID.

FLUID FOR GAS-METERS.—The undersigned is prepared to furnish the Glycerine Meter Fluid in quantities to suit purchasers. *It does not evaporate, can be made to stand any degree of cold liable to occur in this country or in Canada, and does not corrode the metals of the meter. It has been in use successfully for the last three years.*
For particulars, references, &c., address the manufacturer, HENRY BOWER,
Box 363, Philadelphia, Pa.

MEDALS AWARDED TO THOMAS GLOVER'S PATENT DRY GAS-METERS.

MANUFACTORIES

SUFFOLK ST. CLERKENWELL GREEN. & ALLEN ST. GOSWELL ST. LONDON.

BOSTON, MASS., 1 BARRETT STREET,—August 2, 1860.

RICHARD GLOVER begs to inform GAS COMPANIES and CONTRACTORS that he has always on hand a large assortment of THOMAS GLOVER'S (of London) celebrated DRY GAS METERS.

THOMAS GLOVER'S Meters have now been in use in the United States and British Provinces, for the last FOURTEEN YEARS, and are extensively used by many Gas Companies, to their entire satisfaction; and R. GLOVER can with all confidence refer to them in proof that THOMAS GLOVER'S Meters are— the most PERFECT in PRINCIPLES— the most CORRECT in REGISTRATION—and more DURABLE than any other Dry Gas Meter made in the United States or Great Britain. R. GLOVER will at all times be glad to repair any Gas Meters sent him at the above factory. If any of them are of THOMAS GLOVER'S manufacture, and of a more recent date than THREE years, he will make no charge.

DOWN & MERRIFIELD,

Nos. 340, 342, 344 and 346 West Twenty-second Street, North River, NEW YORK CITY,

MANUFACTURERS OF

WET AND DRY PATENT GAS-METERS,

Pressure-Registers, Pressure-Indicators and Gauges, Station, Show, Customer, and Experimental Gas-Meters, Centre or Hydraulic Valves, Governors, Compensators for Exhausters, and the Standard, Testing Gas-Holders* for Proving Meters, now used in the State of New York in compliance with an Act of the Legislature.

ALSO, BUNSEN'S PHOTOMETER, WITH COMPLETE APPARATUS FOR WORKING THE

* The standard of measurement of this Gas-Holder is given by Professors TORREY, of the U. S. Assay Office; JOY, of Columbia College; GIBBS, of the Free Academy, and several other distinguished scientific gentlemen.

JOHN J. GRIFFIN & CO.,

No. 7 BEEKMAN ST., and 76 WEST THIRTY-SEVENTH ST.,

NEW YORK CITY,

MANUFACTURERS OF WET AND DRY GAS-METERS,

Station-Meters, Proving-Machines, Show-Meters, Test-Meters, Pressure Indicators, &c.

All of our Work is Guaranteed to be of the First Quality, as well as the material, and for this we can refer to numerous Gas-Light Companies.

JOSEPH LENNIG & CO.,

Nos. 313 & 315 NEW MARKET St., above Vine St., Philadelphia, Pa.,

MANUFACTURERS OF

WET AND DRY

PATENT

GAS-METERS,

STATION,

SHOW, CUSTOMER,

AND

EXPERIMENTAL

METERS.

PHOTOMETERS,

PRESSURE-REGISTERS,

INDICATORS,

AND

GAUGES,

GOVERNORS, METER-PROVERS,

CENTRE-SEALS,

FLUID GAUGES, &c.

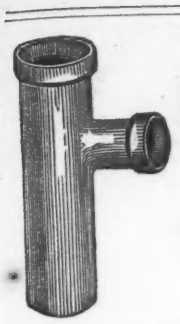
The flattering Testimonials we are receiving from Gas Officers, accompanied with expressions of such general satisfaction, and the fact of a tried experience for fourteen years, must present itself as a security to parties desirous of securing the most reliable Instruments. We therefore recommend our Patent Dry Gas-Meter, believing it superior to any Meter manufactured. Messrs. J. LENNIG & Co. confine their sole attention to the business of GAS-METER making.

Our materials are the best in use; the strictest attention is given to workmanship, and we guarantee entire satisfaction to all purchasers.

Purchasers may at any time inspect our Works, and the materials of which our Meters are manufactured. We are fully prepared to execute all orders, upon the shortest notice, and it will be to the interest of parties to call upon us.

☞ Each Meter Tested Separately by a Sworn Inspector, and Sealed when desired. ☜

METERS REPAIRED AND FORWARDED WITH DISPATCH.



GAS, STEAM, SMOKE,

PURE WATER & SOIL PIPE,

FROM

JOSEPH CLIFF,

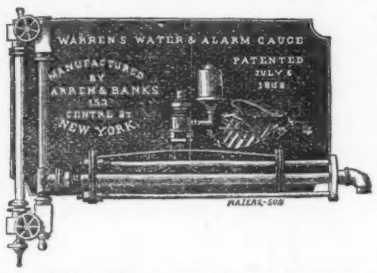
Wortley Fire-Brick Works, Leeds, England.

T. W. PARMELE, Agt.,

No. 4 Irving Place, N. Y.

WARREN'S PATENT WATER & ALARM GAUGE,

For Protecting the Flues and Preventing Steam-Boiler Explosions.



This is a reliable High and Low Water Detector, arranged so as to render it one of the best Water Gauges ever attached to a Steam-Boiler; always presenting before the Engineer at sight the exact height of the water, and if, by oversight or by sudden leakage, the water gets low in the boiler, it will cause an alarm before the water gets below the flues, thereby preventing an explosion. This Gauge can be made to alarm at any point desired as a High Water Detector, thereby preventing the water from getting to that height as to be forced into the cylinder of the engine, often causing serious accidents. Thus it is a High as well as a Low water Detector. For sale by

WARREN & BANKS,

153 Centre st., corner of Canal st., New York,

Where a Gauge is constantly in operation.

JOHN RUSSELL & CO.,

PATENT TUBE MAKERS,

THE OLD TUBE WORKS, WEDNESBURY, AND THE ALMA WORKS, WALSAL, STAFFORDSHIRE,

69 UPPER THAMES ST., & 5 CHARLES ST., SOHO, LONDON;

AND 35 GRANBY ROW, MANCHESTER, ENGLAND.

The original Manufacturers of WROUGHT-IRON GAS TUBES, and the Inventors of the Lap-welded Tubes for Locomotive and Marine Boilers. All kinds of TUBES and FITTINGS, whether for Gas, Steam, or Water. Galvanized and Composition Tubes. Chandeliers, and every kind of Brass work for Gas and Steam.

STOCKS, DIES, AND TAPS OF ALL SIZES. CAST-IRON PIPE AND GAS-METERS.

All Goods Warranted.

THE

STERLING GAS-REGULATOR,

Improves the Light and Saves a Large Per Centage of Gas.

MANUFACTURED BY THE

WHEELER & WILSON SEWING MACHINE COMPANY.

It is well known that Printers require the best and most brilliant light In proof of the superiority of these Machines over all others, the following New York establishments are using them, and testify to their excellence:—New York Times, New York Herald, New York World, New York Tribune, New York Sun, Journal of Commerce, Courier & Enquirer, Evening Post, The Zietung, Dispatch, Leader, Scientific American, Advertiser and Spectator, Independent, Daily News, Harper's Monthly and Weekly, Transcript, Mercury, Atlas, Life Illustrated, Albion, Spirit of the Times, AMERICAN GAS-LIGHT JOURNAL, Christian Enquirer, Churchman, Church Journal, Christian Advocate, Christian Ambassador, Christian Intelligencer, Observer, Sunday Times, Sunday Courier.

By order of the New York and Brooklyn Common Councils, these Regulators are now used in the City Halls, Police Stations, Markets, and other Public Buildings in both cities.

They are Warranted by the

WHEELER & WILSON SEWING-MACHINE CO.,

505 BROADWAY, NEW YORK,

To keep in order, and always maintain the pressurs of the Gas at the lowest point for a brilliant light and economical combustion. They are so constructed that *under no circumstances can the Mercury get into the Meters, or in any way injure them.*

GENGEMBRE'S PATENT

NON-FREEZING AND NON-EVAPORATING

GAS-METER FLUID.

By the use of this Fluid, the WET GAS-METER of ordinary sonstruction is rendered the most perfect and most reliable Gas Measuring Instrument ever offered to Gas Companies. In winter the Meter will continue to work equally well, *however exposed it may be;* and in summer the level of the Fluid remaining constant without refilling, the measurement of the Gas will be both uniform and constant.

The use of this Fluid is both easy and economical, and Gas Companies desirous of using it will be licensed on liberal terms. For further particulars, and certificates of parties having used the same for over three years, and for city rights, apply to

A. DOISY, Box 1180,

General Agent and Attorney for GENGEMBRE'S PATENT.

N. B.—No Sales of Territorial Right, or Licenses for using my Patent will be valid, without being ratified by my Signature, as I have no Agent authorizeed to execute the same.

H. P. GENGEMBRE, PATENTEE, Box 48, Alleghany City, Penn.

BURTIS' PATENT COMPENSATING COUNTERBALANCE FOR GASOMETERS.—This Improvement consists in making the attachment to the Gas-Holder by counterweights in such a manner as to effectually prevent it from getting out of level so as to bind, and also to prevent any escape of Gas at Cup or Hydraulic seal, where the Holder is on the Telescopic plan. Holders that work out of level are thus evenly balanced, and prevented from binding or lodging against Tank-wall and falling down, thereby being rendered unfit for service. Where Holders or sections of Holders cannot be used on account of the above difficulties, this arrangement will remove them, and place the Holders in good working order; moreover, with this attachment, deep tanks are not necessary.

BURTIS' COUNTERBALANCE has been in use for three years at the Gas-Works, Chicago, Ill. Its resistance to high winds and snow-drifts is alone sufficient to recommend its general adoption. For engravings, see AMERICAN GAS-LIGHT JOURNAL for June; 1860, p. 221. Address P. T. BURTIS,

Engineer Gas-Works, Chicago, Ill.

GAS THERMOMETERS FOR ascertaining and regulating the temperature of the gas while passing through the purifiers into the station meters. For sale at the Rooms of the AMERICAN GAS-LIGHT JOURNAL.

UNION WIRE-WORKS.

ROBERT McMURRAY & CO., No. 29 Fulton Street, New York, Manufacturers of Copper, Brass, and Iron Wire Cloth for Gas Works, all kinds of Foundry Riddles, Sieves, and Screens. Improved Wire Window Shades, Wire Bolting Cloth, Duster-Wire, Wire Cloth for fanning machines, Rosin, &c., Locomotive Wire, Fire Guards, Ornamental Wire Work of every description. Patent Improved Wove and Laid made, repaired and designed to order.

McKINNY & KELLY,

MANUFACTURERS OF

COAL-SCOOPS AND COKE-BARROWS,

FURMAN ST., near Fulton Ferry, Brooklyn, N.Y.

F. BUTTS & CO.,

(Successors to BUTTS & KENDALL,)

DEALERS IN THE CELEBRATED

STERLING COAL,

PITTSBURGH AND OTHER GAS-COALS,

CLEVELAND, OHIO.

We beg to call the attention of Gas-Light Companies to the following, from which (and others), and the universal expression of Gas Men, as to the superior quality of

STERLING COAL,

we believe that it is THE BEST COAL IN THE COUNTRY.

From the Manhattan Gas-Light Co., N. Y.

Gentlemen—Yours of the 9th inst. is received. The "Sterling Coal" received from you during the past year worked very satisfactorily—averaging 9520 cubic feet of 15 candle Gas per ton of 2240 lbs., and 41 bushels of Coke weighing 1465 lbs.

We consider it among the best of American Gas Coals, for the quantity and quality of the Gas produced, and also for the excellent quality of its Coke.

I am, Gentlemen, Your Obedient Servant,

CHARLES ROOME, *President.*

From the Rondout and Kingston, N. Y. Gas-Light Company.

Gentlemen—The 600 tons of Coal ordered from you in August, 1859, has now been in use over four months, to my entire satisfaction.

Its average yield is 4 40-100 feet, and a good strong light The Coke produced equal, both in quality and quantity, to best English Coking Coals. It burns very freely, with little clinker. In purification it is economical, using no more lime than New Pelton. It is superior to any American coal I ever used. I shall be pleased to give you any further information at my office in New York.

WM. W. HAGUE, 552 Broadway.

From the Sandusky, O. Gas Co.

Gentlemen—This Company has used your Sterling Coal since July 3d, 1856, and are still continuing the use of it with satisfaction to the Company and consumers. The average product has been 8,620 feet of Gas per ton of 2,000 lbs., and 37 bushels of Coke of very superior quality. The Gas is as good as that obtained from Pittsburgh coal. I consider it the best coal ever used in our works.

I am, Gentlemen, Yours Respectfully,

WILLIAM HUDSON, Sup't and Sec'y.

From the Toledo, O., Gas-Light Co.

Gents:—Your favor of the 18th inst. to hand and noted.

The Sterling Coal received from Messrs. Butts & Co., the last summer and fall, fully sustains the character it has as a Gas Coal, from previous use in our works. We think the quality of Gas is very good, a little better than that produced from the coal had of them the year previous—yielding 8,666 feet per ton of 2,000 lbs., and 36 bushels of Coke, of very good quality, well adapted to our use.

Respectfully Yours,

GEO. SPENCER, President.

From the Buffalo, N. Y., Gas-Light Co.

Messrs. F. BUTTS & Co.—The Sterling Coal we have had from you we find to be an excellent Gas Coal. The yield of both Gas and Coke is good. The illuminating power of the Gas is high and the quality of the Coke is very good.

ROBERT ROBSON, Foreman Gas-Works.

From the Cleveland, O., Gas-Light & Coke Co.

Gentlemen—This Company has used between 3,000 and 4,000 tons of your "Sterling Coal," and are still using it with satisfactory results. We find the average product of a ton of 2,000 lbs. is about 8,800 feet of Gas, and about 37 bushels of Coke. The Gas is of good illuminating power and quite free from sulphur or other impurities, one bushel of lime purifying 9,000 feet, and the Coke of very superior quality.

The yield of Gas is about the same as from the Pittsburgh Coal, and the Coke is better adapted to our use.

Yours truly,

T. DWIGHT EELLS, Secretary.

From the Albany, N. Y., Gas-Light Co.

Messrs. F. BUTTS & Co.—*Gentlemen*—We have been using your "Sterling Coal" at these works for two years, finding it all that is important in Gas-making Coal, as respects yield and quality of Gas, and freedom from Sulphur—as much so as any of the Coking Coal now in use. We are disposed to contract for a further supply of the same quality. Very Respectfully,

PAUL A. SABBATON, Sup't.

From the Troy, N. Y. Gas-Light Co.

Messrs. F. BUTTS & Co.—*Gentlemen*—The Coal we have used the past year at our works has been mostly "Sterling." It has given us full satisfaction in every respect. S. S. DAUCHY, Sup't.

The following analysis of Sterling Coal was made by Prof. J. LANG CASSELS, Professor in the Cleveland, O., Medical College, who stands at the head of his profession as a Chemist, and any statement made by him can be relied upon with safety.

Sp. gr. - - - - - -	1,288	
Hygremac ric Moisture, - - -		1.85
Volatile Combustible Matters, -		34.15
Coke, (clear and porous,) - -		64.00
		100.00
Fixed Carbon in the Coke, - -	62.00	
Ashes, (yellowish white,) - -	2.00	
	64.00	

COMPOSITION OF ASHES.

Silex, - - - - - - - - - -	0.80
Al mini, - - - - - - - - -	0.45
Sulphate of Iron, - - - - - -	0.75
	2.00
Per centage of Sulphur, - - - - -	0.2

J. L. CASSELS, M. D.,

Prof. of Chemistry, Clev. Med. Col.

P. S.—The specimen from which the above analysis was made, was taken by myself from a car load, and may be regarded as a fair average; in fact this Coal is very uniform in its characteristics. It also yielded 4 per cent. more gas than the Pittsburgh Coal. J. L. C.

We would also refer to Gas-Light Companies in the following places:

NEW YORK CITY, (Manhattan and New York Cos.,) BROOKLYN, ALBANY, TROY, WEST TROY, ROCHESTER, OSWEGO, RONDOUT, KINGSTON, ALBION, BROCKPORT, SENECA FALLS, ELMIRA and LYONS, in the State of New York; CLEVELAND, TOLEDO, SANDUSKY, NORWALK and OBERLIN, in Ohio; DETROIT, ANN ARBOR, GRAND RAPIDS and KALAMAZOO, in Michigan; COBURG, in Canada; Chicago, Ill., and two Companies in MILWAUKIE, Wisconsin.

The extensive Mines in Pennsylvania, known as the Sterling Hills, (which are the highest in that part of the State,) are wholly under our control, and the coal is mined and sold only by us or our agents. As the coal has improved the further we have got in, and being several hundred yards further in than last season, with about a hundred feet more earth over it, *the quality of Coal we mine this year will be better than ever.* Some Coals are good in one or two particulars, and defective in others; but in combining all the qualities desired in a Gas-Coal, we know of none equal to the STERLING. Getting it to this place by Railroad, a supply can be had during the Summer months, (as well as at all other times,) which is not the case with coals dependent upon high water for transportation, as are those shipped from Erie, Pa. Having increased our mining facilities, we are prepared to ship on a more extensive scale than heretofore, and should be pleased to receive your orders.

☞ Having discovered that certain unprincipled Coal Dealers are endeavoring to sell an inferior article of Coal, under the name of STERLING, we deem it our duty, as well for your interest as for ours, to notify you, that you may be on your guard in purchasing what you might think was STERLING. *There is but one Sterling Coal Mine, and that Mine we have the full and entire control of;* and Gas-Light Companies can obtain the GENUINE STERLING COAL only by ordering direct from us, or F. WELLINGTON, Syracuse, N. Y., who is our only agent for that State.

F. BUTTS & CO.

CLEVELAND, O., March 1st, 1861.

WATER-METERS.

H. R. WORTHINGTON'S PATENT Water-Meter.—This Meter combines accuracy, simplicity and remarkable durability, with such ease and certainty of motion, as to offer no appreciable obstructions to the flow of water in the pipes to which it is connected, as it runs and registers upon three inches head, or when delivering the smallest stream. These qualities, with its low cost, have caused its extensive adoption by corporations and individuals, in many of our largest cities.

HENRY R. WORTHINGTON,
61 Beekman street, N. Y.

STOP-COCKS, &C.,

DANIEL THOMPSON, Machinist and Manufacturer of Stop-Cocks, Fire-Plugs, &c., for Water-Works, Stop-Cocks, Valves, Drip Pumps, &c. for Gas-Works, No. 138 Elfreth Alley, Philadelphia.

SCIENTIFIC BOOKS.

GAS ENGINEERS' LIBRARY.—A few works indispensable to Engineers, Contractors, and others engaged in the construction of Gas-Works and manufacture of Gas, have been selected, out of a large stock of chemical and other works, and are recommended to the attention of those interested. See page 203, vol. II, of this JOURNAL.

For sale at the Rooms of the AMERICAN GAS-LIGHT JOURNAL, New York.

GAS WORKS
TO LET.

For particulars, address D. CONGDON.

SAG HARBOR,
June 10th, 1861.

PLUMBERS & GAS-FITTERS.

LOCKE & CRAIGIE, PLUMBERS and GAS-FITTERS, No. 12 East 20th street, New York.

LOCKE, CRAIGIE & CO., Gas-Fittings, Chandeliers, Brackets, Globes, &c., No. 927 Broadway, New York.

☞ Particular attention paid to country work.

JAMES HELME'S CHANDELIER AND Gas-Fitting Establishment, No. 58 East Thirteenth street, between Broadway and University Place, New York.

BRADBURY M. JOHNSON, GAS-FITTER and PLUMBER, No. 111 East Eighteenth street, New York.

A large and elegant assortment of CHANDELIERS, BRACKETS, &c. Gas-Pipe and Posts made for Gas Companies on favorable terms.

SPECIAL NOTICE.

FISHKILL GAS-LIGHT COMPANY.

R. B. CARY, *Pres't.* - - AUG. HUGHSON, *Sec'y.*

THE undersigned Directors of the Fishkill Gas-Light Co. hereby give notice, that neither they, nor the Company, will be held responsible or liable for any debts contracted by any person on its account, unless made through James E. Van Steenbergh, the Treasurer thereof; and all payments to the Company for Gas-bills or anything else, are required to be made to him only.

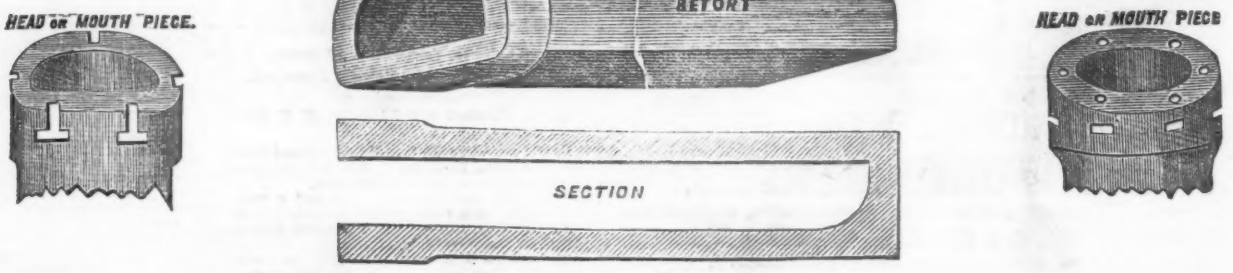
The Directors intend to conduct the business—as near as may be—on the CASH PRINCIPLE, and payments for Gas-bills, due the Company, and bills against it, will be settled on or about the first of each month.

DIRECTORS:

RICHARD B. CARY, H. F. WALCOTT,
SAMUEL A. HAYT, AUGUSTUS HUGHSON,
NORRIS BAXTER.

Fishkill, N. Y., August 1, 1859.

KING BROTHERS,
STOURBRIDGE, ENGLAND, FIRE-BRICK AND RETORT WORKS.



KING BROTHERS beg especially to call the attention of Gas Companies to the superiority of their Retorts, which are made from the celebrated STOURBRIDGE FIRE-CLAY. Mr. King has patented a Kiln for Burning Retorts, by which Patent all Cold Air is excluded from the Kiln while burning, thus rendering them

Free from Cracks and Correct in Form.

By great care in Manufacturing, combined with the advantages in Burning, a VERY SMOOTH SURFACE is obtained, rendering them less liable to carbonize.

RETORT OVENS, FIRE-BRICKS, GUARDS, SADDLES, RABITTED BURS, FLUES, AND QUARRIES, ARE ALL MANUFACTURED OF THE SAME QUALITY OF CLAY.

EVERY RETORT AND BRICK IS BRANDED "KING BROTHERS, STOURBRIDGE."

Apply to E. W. BARSTOW, 83 Maiden Lane, New York, where samples can be seen.

HARRIS & PEARSON,

PROPRIETORS OF

Best Glass-House Pot & Crucible Clay.

Manufacturers of Fire-Bricks, Gas-Retorts, and Glass-House Furnace-Bricks of every description.

AMBLECOTE FIRE-CLAY AND BRICK WORKS, STOURBRIDGE, ENGLAND.

CODE, HOPPER & GRATZ,

1500, 1502 and 1504 FILBERT ST., PHILADELPHIA.

MANUFACTURERS OF

Pressure Registers, Pressure Indicators, Pressure Gauges, Photometers, Governors, Station Meters, Customer Meters, (Wet and Dry,) Experimental Meters, (Wet and Dry,) Show Meters, (Wet and Dry,) Meter Provers, Centre Seals, &c.

The high reputation which we have enjoyed for more than twenty-two years, and the fact that we have manufactured a greater number of Gas-Meters than all other manufacturers in this country combined, must present itself as a security to parties desirous of securing the most reliable instruments. Having completed a most extensive addition to our Factory, and added many important improvements to our machinery, we are enabled to fill orders entrusted to us with despatch, and in all cases *guarantee entire satisfaction.* Our Patent Rotary-Valve Dry Gas-Meter is now used by upwards of Two Hundred Gas Companies, giving general satisfaction; we therefore recommend it, believing it superior to any other Dry Gas-Meter manufactured. All Meters tested separately by a sworn Meter-Inspector, and sealed when desired.

EDWARD COCKEY & SONS'
PATENT GAS-VALVES.

These Valves are formed of two Cast-Iron Cylinders, with segmental divisions, having the faces ground gas-tight—the upper cylinder turning horizontally on the lower one.

The lower Cylinder has pipes from each division, communicating with the vessels to and from which the gas is to be passed. The upper Cylinder has corresponding divisions, so arranged as to direct the passage of gas to the different segmental divisions in the lower part, and when it is turned on the face of the lower one, to alter the flow of gas from one vessel to another.

Each valve has an index-plate provided, which is to be attached to the floor, and a pointer on the cover of the Valve shows which way it is turned. Thus, the Manager of the Works can at once see in which direction the gas is passing.

There are about fifty of these Valves now in use, of sizes varying from two to twelve inches, and they are giving great satisfaction. Amongst the Works at which they are fixed, the following may be mentioned:—

BASINGSTOKE,	CHELTENHAM,	ENNISCORTHY,	FROME,	NEWPORT,	SANDWICH,
BLANDFORD	CANTERBURY,	ELGIN,	GODALMING,	RYDE,	WARMINSTER.

They are in course of erection at other important Works.

IRON WORKS, FROME SELWOOD, ENGLAND.

EDWARD COCKEY & SONS

ALSO MANUFACTURE

Purifiers, Scrubbers, Condensers, and other Improved Gas Apparatus,

HAVING PATTERNS SUITABLE FOR GAS-WORKS OF DIFFERENT SIZES.

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